Vol. VII APRIL, 1921 No. 3

ENTRIES 1528-2271

BOTANICAL ABSTRACTS

A monthly serial furnishing abstracts and citations of publications in the international field of botany in its broadest sense

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BALTIMORE, U. S. A.

Entered as second-class matter, November 9, 1918, at the post office at Baltimore, Maryland, under the Act of March 3, 1879

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Price, net postpaid, per volume: { $3.00, United States, Mexico, Cuba
$3.12, Canada
$3.25, Other countries

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Vol. VII APRIL, 1921 No. 3

ENTRIES 1528–2271

AGRONOMY

C. V. PIPER, *Editor*
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1528. ANONYMOUS. **Oktobertagung. Sitzungsberichte.** [**Report of the October meeting (German Agricultural Society).**] Mitteil. Deutsch. Landw. Ges. 35: 592–603. 1920.—A general report of the meeting of the society and of its sections. Plant breeding section report on page 596 contains the following: "An account of a new organization of seed dealers and growers," "the potato as foundation of our nutrition," "the treating of grain."—*A. J. Pieters.*

1529. ANONYMOUS. **Conservacão da semente do arroz.** [**Conservation of rice seed.**] Bol. Agric. Nova Goa [Portuguese East India] 1: 91–95. 1919.—Seed rice to produce best results should be selected grain, free from insects or fungous diseases, and should be stored in a dry place. Varieties should not be mixed.—*John A. Stevenson.*

1530. ANONYMOUS. **Products of the peanut. The manufacture of foodstuffs.** South African Jour. Indust. 3: 557–561. 1920.

1531. ANONYMOUS. **Report of Committee on uniform rules and regulations to govern certification of seed potatoes.** Monthly Bull. California State Commission Hort. 8: 304–307. 1919.

1532. ANONYMOUS. **Tobacco in South Australia.** Jour. Dept. Agric. South Australia 24: 33–35. 1920.—Brief article on the possibilities of tobacco growing in South Australia.—*Anthony Berg.*

1533. BARBER, C. A. **The growth of the sugar cane.** Agric. Jour. India 15: 425–432. 1920.—General discussion on the causes of branching of canes and branching in different groups of canes.—*F. M. Schertz.*

1534. BARRUS, M. F. **Discussion of potato seed certification service.** Monthly Bull. California State Commission Hort. 8: 278–280. 1919.

1535. BARTHE, A. E. **Cultivo racional del maiz.** [**Rational cultivation of maize.**] Rev. Agric. Com. y Trab. 3: 204–212, 247–253. *9 fig.* 1920.

1536. Breakwell, E. **Native and introduced grasses at Mount George, Manning River.** Agric. Gaz. New South Wales 31: 399–400. *1 fig.* 1920.—The author reports on trials of native and introduced grasses. Coolah grass (*Panicum prolutum*) was especially drought resistant. It yielded about 8 tons dry fodder per acre. Native Australian millet (*Panicum decompositum*) was nearly as good as Coolah grass. *Phalaris bulbosa* proved the best winter grass, producing excellent feed through the cold months.—*L. R. Waldron.*

1537. Breakwell, E. **Popular description of grasses.** Agric. Gaz. New South Wales 31: 789–792. *2 fig.* 1920.—Deals with 5 species of *Sporobolus—S. indicus, S. diander, S. virginicus, S. Lindleyi,* and *S. actinocladus,* all but *S. virginicus* being figured. These grasses are not economically important, either because of unpalatability or scarcity. None is cultivated.—*L. R. Waldron.*

1538. Burt, B. C., and Nizamuddin Haider. **Cawnpore-American cotton: An account of experiments in its improvement by pure line selection and of field trials. 1913–1917.** Agric. Res. Inst. Pusa, Bull. 88. *31 p., 10 pl.* 1919.—Isolation of pure races was started in 1912. Plants were classified according to branching habit, hairiness of leaf, color of stamens, ginning percentage, length and fineness of lint, shape and size of boll, leaf shape, stem and foliage color. In later work the character of the root system was found to be an important factor. Attention was also given to the length of vegetative period prior to flowering, length of internodes, and the characteristics of secondary fruiting branches. In 1916 the number of selections had been reduced to 14, and these were divided into five groups according to the dates of maturity. Field tests were made and practical commercial valuations were secured on the ginned cotton during the seasons of 1915–1918 inclusive. The results indicate that selected strains of Cawnpore-American Cotton will yield as much as the *desi* cotton commonly grown and that it will bring a much better price, under proper marketing conditions. The Cawnpore-American Cotton must be sown early, with irrigation; *desi* cotton is best grown under similar conditions. The methods of sowing and culture are somewhat different for Cawnpore-American than for the *desi* cotton.—*N. J. Giddings.*

1539. Calvino, Mario. **Quinientas toneladas de forraje fresco por hectârea mediante la Yerbe Elefanto de Rhodesia. [Five hundred tons of fresh forage per hectare by means of the elephant grass of Rhodesia.]** Rev. Agric. Com. y Trab. 3: 172–183. *14 fig.* 1920.—The Napier or elephant grass (*Pennisetum purpureum* Schum.) was introduced into Cuba by the author in 1918. Its history and introduction into various countries is given. It may be propagated in various ways but most easily by cuttings. Best crops were secured by cutting at intervals of about forty days. Crops of about 60 tons (metric) per hectare were secured. Analyses showing the food value and the mineral constituents are given. The analyses of the fresh grass show the water content to be 24.5–38.2 per cent.—*F. M. Blodgett.*

1540. Clouston, D., and F. J. Plymen. **Principal fodders in the central provinces and Berar, including the small bamboo (Dendrocalamus strictus).** Agric. Jour. India 15: 380–385. 1920.—Egyptian clover (*Trifolium alexandrinum*) and the small bamboo (*Dendrocalamus strictus*) show promise for adoption on a large scale. *D. strictus* is especially valuable for light soils which cannot be irrigated. The yield (20 tons per acre) is large and the leaves contain four times as much protein as the common grasses while the proportion of indigestible fiber is greater in grasses. The seed may be used as feed and the mature culms serve many practical purposes.—*F. M. Schertz.*

1541. Cockerell, T. D. A. **Sugar-beet seed.** Nature 104: 661. 1920.—Prior to 1909 all sugar-beet seed used in the U. S. A. was imported from Europe. The first attempt to grow seed in the U. S. A. was made in Montana in 1909 by Mr. Hans Mendleson, who continued his experiments on a small scale. When the supply of foreign seed was cut off by the war the industry had developed to such an extent that the United States was able to produce 5,211,000 pounds of seed in 1916 and 5,546,000 pounds in 1917.—*O. A. Stevens.*

1542. Colebatch, W. J. **Roseworth Agricultural College harvest report 1919–1920.** Jour. Dept. Agric. South Australia **23**: 659–671, 738–753. 1920.—A report giving yields of grain crops, and results of variety tests of oats, wheat and barley grown under different methods of cultivation and with varying amounts of fertilizers. The data, in most cases arranged in tabular form, compare yield and rainfall in 1919 with those of a series of years.—*Anthony Berg.*

1543. Ehrenberg, Paul. **Versuch eines Beweises für die Anwendbarkeit der Wahrscheinlichkeitsrechnung bei Feldversuchen (zweiter Aufsatz). [Test of the applicability of the probable error calculation in field trials.]** Landw. Versuchssta. **95**: 157–294. 1920.—Presents data and further substantiates the value of the Gauss formula for calculating the probable error in determining the results of field trials.—*A. T. Wiancko.*

1544. Furby, E. B. **Top-dressing lucerne with superphosphate. Field experiments at Yanco.** Agric. Gaz. New South Wales **31**: 699–700. 1920.—Financial net gains of about $36 and $22 per acre resulted from the use of respectively 2 cwt. and 1 cwt. of superphosphate applied in the spring (September). One cwt. of superphosphate applied in the fall showed scarcely any gain, while 2 cwt. gave a profit of about $18. Five check plots were cultivated but not manured. Two additional plots were neither cultivated nor manured. Eleven irrigations were made during the experiment.—*L. R. Waldron.*

1545. Gerlach. **Die Entbitterung und Verwertung der Lupinen. [Removing the bitter principle and utilizing lupines.]** Mitteil. Deutsch. Landw. Ges. **35**: 619–620. 1920.—The author reviews some of the methods used to remove the bitter principle from lupine seed. He points out that the high cost of protein in Germany at this time may warrant the expense involved in utilizing the large amounts of protein in lupine seed for cattle feed and even as human food.—*A. J. Pieters.*

1546. Hammond, J. W. **Green forage crops and corn for fattening lambs.** Ohio Agric. Exp. Sta. Bull. 340. *45–99.* 1920.—The first two experiments were designed to compare permanent bluegrass pasture with rape pasture or with a succession of the three annual crops—rye, clover, and rape; to secure data on the economy of feeding corn on pasture; and to compare the economy of raising lambs in pasture and in dry lot. The third experiment was intended to yield further data on the problems studied in the first two and in addition to compare a combination of rape and bluegrass pastures with either of the two pastures used alone, and to compare Shropshire × Merino with Merino lambs with respect to rate and economy of gains. The fourth experiment was designed to secure data regarding the economy of feeding a full feed and a half feed of corn to lambs on rape pasture and to compare Shropshire and Shropshire × Merino lambs with respect to rate, economy, and character of gains produced on rape pasture.—*R. C. Thomas.*

1547. Harris, E. **Grading New South Wales wheats. The proposed standards.** Agric. Gaz. New South Wales **31**: 771–772. 1920.—The three classes are: (1) Australian Hard Red, (2) Australian Hard White, and (3) Australian White. Each class has five grades as follows: Premium A1, Premium B, and Nos. 1, 2, and 3. Respective minimum weights are: 65, 63, 60, 58, and 56 pounds per bushel; maximum moisture content ranges from 12.5 to 13.5 per cent and maximum percentage of damaged kernels from 2 to 7 per cent. Most of the Australian export wheat would come under No. 1 Australian White.—*L. R. Waldron.*

1548. Harris, Frank S. **The agronomist's part in the world's food supply.** Jour. Amer. Soc. Agron. **12**: 217–225. 1920.—Presidential address.—*F. M. Schertz.*

1549. Heinrich, M. **Aufgaben und Ziele der Samenkontrolle. [Problems and aims of seed-control.]** Jahresber. Ver. Angew. Bot. **16**: 116–123. 1918.

1550. Heinrich, M. **Beiträge über die Keimung bespelzter und nackter Timothyfrüchte. [Contributions regarding the germination of unhulled and naked timothy seeds.]** Landw.

Versuchssta. 93: 258–276. 1919.—Germination tests of naked and covered, or beglumed, timothy seeds taken at random from the same samples showed that the former had a lower percentage germination than the latter, although the naked seeds are generally the largest and ripest. The difference seems to be due to the greater sensitiveness of naked seeds to unfavorable seed bed conditions. The naked seeds were more liable to mold. Exposure of the germinating seeds to light lessened the rate of germination of both kinds, but the final result was not appreciably affected in either case.—*A. T. Wiancko.*

1551. Howe, H. E. **The search for cereals.** Sci. Amer. Monthly 1: 553–554. 1920.—A brief account of the collecting of cereals from foreign countries for the purpose of introducing new strains and varieties into North America.—*Chas. H. Otis.*

1552. Hutcheson, T. B., and T. K. Wolfe. **The effect of fertilizers on the germination of seeds.** Virginia Agric. Exp. Sta. Ann. Rept. 1918–1919: 33–37. 1920.—The experimental work consisted of tests in small flats on two different types of soils under greenhouse conditions. The injurious effect of fertilizers on germination varies with the kind of seed, the soil type, and the method of application. With few exceptions materials applied in the row in direct contact with the seed were more injurious than when applied broadcast and mixed with the soil before seeding.—*F. D. Fromme.*

1553. Jex, Wallace. **Sugar and sugar products.** South African Jour. Indust. 3: 705–716. 1920.—The early history and development of the sugar industry in Natal is outlined, and an account given of the cultural methods and manufacturing processes employed.—*E. M. Doidge.*

1554. Johnson, E. C. **Twenty-ninth annual report.** Washington [State] Agric. Exp. Sta. Bull. 155. *57 p.* 1920.—Contains brief summary reports of experimental work by the Division Heads, among which are the following: The value of pea straw as a roughage for lambs, for wintering pregnant ewes, and for ewes suckling lambs; forage crops for pork production; a comparison of different inoculating cultures and factors that control the infection of legumes by bacteria; seed analysis; spraying for weeds; influence of cultivation of soil on nitrogen composition of wheat; a comparison of corn, artichoke, and sunflower silage as feeds for milk production; sweet clover for pasture for dairy cows; "sour milk" silage; field crop varieties; value of a nurse crop; cultivation and rate of seeding wheat; inheritance of varietal characters; crop rotations; orchard pollination; Mendel's law in blackberry and raspberry hybrids; apple rosette; orchard cover crops; renovation of prune orchards; apple storage; fruit evaporation and by-products; wheat smut, the rhizoctonia disease, plant disease survey; oat smut; the nitrogen supply in semi-arid soils; and soil moisture studies.—*F. D. Heald.*

1555. Kelly, H. J. **Planting Sudan grass.** Agric. Gaz. New South Wales 31: 719–720. *1 fig.* 1920.—Brief notes are given on general culture, time of planting, and quantity of seed to sow.—*L. R. Waldron.*

1556. Kerle, W. D. **Farmers' experiment plots. Potato experiments, 1919–20. Upper north coast district.** Agric. Gaz. New South Wales 31: 781–788. *2 fig.* 1920.—Variety and manurial experiments were conducted in conjunction with farmers. The outstanding feature of the experiments was the greatly increased yields brought about by the use of phosphorus, the maximum net increase in market value of crop from five stations averaging over $200 per acre.—*L. R. Waldron.*

1557. Lehkum, P. **Ueber ein neues Verfahren zum Abkeimen der Kartoffeln. [A new process for removing sprouts from potatoes.]** Mitteil. Deutsch. Landw. Ges. 35: 587. 1920.—Brief note referring to work done by Schribaux (citation not given). The process consists in immersing sprouting potatoes in weak sulphuric acid.—*A. J. Pieters.*

1558. Lindner, P. **Unser Getreide als Fettquelle und die Bedeutung der Aleuronschicht für das Getreidekorn. [Our cereals as a source of fats and the significance of the aleurone**

layer to the seed.] Jahresber. Ver. Angew. Bot. 16: 29–31. 1918.—There is nine times as much fat in the aleurone layer as in the germ; consequently about a million tons of fat from the grain harvest go into the bran each year. This was formerly fed to cattle but during the war was used in bread. Although cattle digest this fat, it passes unchanged through the human alimentary tract. If, however, the cell walls of the aleurone layer are first dissolved by acid, the fat becomes digestible for man.—This fat is deposited in the aleurone layer and hulls of the grain to prevent water from penetrating to the interior.—*P. J. Anderson.*

1559. McKay, M. B. **Uniform rules and regulations for seed potato certification in the Pacific Coast states.** Monthly Bull. California State Commission Hort. 8: 288–291. 1919.

1560. Maiden, J. H. **Chats about the prickly pear. No. 6.** Agric. Gaz. New South Wales 31: 645–648. 1920.—Summarizes certain bulletins dealing with prickly pear as stock food in the U. S. A.—*L. R. Waldron.*

1561. Makin, R. N. **Farmers' experiment plots. Maize experiments, 1919–20. South coast district.** Agric. Gaz. New South Wales 31: 795–797. 1920.—Variety and manurial experiments were conducted in conjunction with farmers. Several varieties of maize from the U. S. A. gave promising results.—*L. R. Waldron.*

1562. Makin, R. N. **Lucerne on the coast. The south coast.** Agric. Gaz. New South Wales 31: 384–385. 1920.—In selecting a site for lucerne, the nature of the subsoil should be determined to the depth of four feet. In preparing for alfalfa care should be taken to destroy the weeds, as many lucerne failures are due to foul land. Deep plowing and too fine a tilth are inadvisable as the soil has a tendency to puddle and choke the seedlings. Sowings should be made from March to June at the rate of 12 to 16 pounds per acre. When plants have developed the third pair of leaves it should be possible to control weeds and conserve moisture by harrowing without damaging the lucerne. A top dressing of 2 cwt. superphosphate once a year and harrowing after each cutting are recommended.—*L. R. Waldron.*

1563. Meek, B. C. **Trials with peas.** Agric. Gaz. New South Wales 31: 397–398. 1920. —In a test with varieties of garden peas Yorkshire Hero outyielded all others. Local seed (variety not stated) outyielded introduced seed. Superphosphate was the best fertilizer.—*L. R. Waldron.*

1564. Mendes, F. C. Correa. **Relatorio de alguns serviços mais importantes a cargo da direcção dos serviços agricolas e florestais. [Report of director of agricultural and forestry service.]** Bol. Agric. Nova Goa [Portuguese East India] 1: 97–109. 1919.—A report of the more important undertakings of the Department of Agriculture and Forestry of Portuguese East India for the period Jan.–Apr., 1919.—*J. A. Stevenson.*

1565. Münter, F. **Pflanzenanalyse und Düngung. [Plant analysis and fertilizers.]** Jour. Landw. 68: 207–224. 1920.—The results of experiments on Lauchstedt loessal soil. Nitrogen and phosphoric acid fertilizers lowered the sulphuric acid content of barley straw, while lime and magnesia were not materially influenced by nitrogen, potassium, or phosphoric acid fertilizers. Meteorological conditions of the single year exert so great an influence on the growth of barley that the fertilizer requirement of the soil cannot be deduced with certainty from the percentage of nitrogen, potassium, and phosphoric acid. The nitrogen content of barley straw was decreased slightly by potassium, more strongly by phosphoric acid. A straw harvest from 1 hectare containing less than 9 kgm. nitrogen indicates a lack of nitrogen in the soil. The barley plant is not suitable for such experimentation; the proportions of nitrogen to potassium or phosphoric acid give no reliable indication as to the fertilizer status of a soil. Sugar beets are better for this purpose. The production of beet roots in a good growing year was influenced by nitrogen, under poor conditions by phosphoric acid, less by potassium. Beet leaf production depends largely on the nitrogenous fertilizers. The lime and magnesia content of the sugar beet roots was affected only moderately by the

use of fertilizer. Potassium fertilizer, however, increased, while phosphoric acid decreased, the lime and magnesia content in the tops. Nitrogen gave variable results. Less than 50 kgm. nitrogen in tops, or 100 kgm. in roots, from 1 hectare denotes lack of nitrogen. Since potassium influences production less, a definite amount taken up by the plant per hectare cannot be given. Less than 14 kgm. phosphoric acid in the roots per hectare indicates a lack of this nutrient, but for the leaves no definite figure is evident. Meteorological conditions so influence the growth of beets that the nitrogen and potassium content does not lead to definite conclusions concerning fertilizer requirements of the soil. For P_2O_5 content the limit of 0.18 per cent in the roots and 0.40 per cent in the leaves can be set. For proof of the fertilizer needs of a soil 2 different plots should be laid out, one fertilized with nitrogen, the other with phosphoric acid and potassium. Conclusions may be drawn according to the following rule: The soil is lacking in potash when in the tops the percentage of potash is less than that of nitrogen. Phosphoric acid is lacking when the ratio $N:P_2O_5$ from the nitrogen plot is greater than 5. Nitrogen is lacking when from the $P_2O_5 + K_2O$ plot the ratio is less than 100:35. The following conclusions were even more reliable: Potash is lacking when it is less than 60 per cent of the nitrogen from the nitrogen-fertilized plot, and phosphoric acid is lacking when P_2O_5 is less than 40 per cent of the nitrogen.—*C. E. Leighty.*

1566. Nielsen, H. B. **Potato certification in California.** Monthly Bull. California State Commission Hort. **8**: 285–287. 1919.

1567. Pfeiffer, T. **Die Bedeutung der sogenannten Schutzstreifen bei Feldversuchen und die Wahrscheinlichkeitsrechnung. [The significance of the so-called protection strips in field trials and the probability calculation.]** Fühlings Landw. Zeitg. **68**: 412–419. 1919.—A criticism of the conclusions of Schneidewind and his associates regarding the use of unplanted and untreated strips between test plots in field experiments, in which it is stated that plots with unplanted division strips show too high yields, that in consequence the effects of manurial treatments are minimized and that by keeping the fertilizer distribution within the outside drill rows of the plot there would be no noticeable effect upon neighboring plots and interspaces might better be omitted. It is shown that plants draw nourishment from the unplanted division strips, that adjoining and differently treated plots do affect each other, and that in field trials involving comparisons of different treatments division spaces should be used but that these should not be left unplanted. It is also held that the probable error calculation can be used to good advantage and should always be employed.—*A. T. Wiancko.*

1568. Pitt, J. M. **Lucerne on the coast. The central coastal districts.** Agric. Gaz. New South Wales **31**: 381–384. 1920.—It is claimed that the alluvial soils bordering the rivers in this region are admirably suited to alfalfa. The Hunter River has long been famed for its enormous output of hay and seed of the Hunter River strain. Formerly, stands 12–20 years old were not uncommon, but now the profitable life averages from 4 to 7 years. This is attributed to various causes, such as inferior seed, decrease of humus, sowing at wrong season, poor preparation, cutting too often and grazing too closely. Cultural instructions are given in detail. Autumn seeding at the rate of 15–20 pounds per acre has proved most satisfactory. Instructions are also given on cutting, curing, and grazing. Top dressing with 2 cwt. of superphosphate applied in the early spring and harrowed in has proved very beneficial.—*L. R. Waldron.*

1569. Rao, U. Vittal. **Habit in sugar canes.** Agric. Jour. India **15**: 418–424. 1920.—A report on the straightness of sugar canes as revealed by pot experiments, station records, and as influenced by suitable crossing. Straight canes are preferred by factories and by cultivators, partly because lodged canes contain less cane sugar and more glucose.—*F. M. Schertz.*

1570. Reynolds, B. A. **Sterilize the fencerow and reduce next year's losses.** Monthly Bull. Dept. Agric. California **8**: 595–599. 1919.

1571. Robinson, W. L. **The use of forage crops in the fattening of pigs.** Ohio Agric. Exp. Sta. Bull. 342. *169–222.* 1920.—Reports on experiments conducted for the purpose of securing more information regarding the influence of the various kinds of forage, of the methods of feeding, and of the character and amount of the concentrates on the economy of production. Comparisons were made of full and limited rations of concentrates with and without a nitrogenous supplement, of self and hand feeding, and of different forage crops and forage crop combinations. The work is presented with the view of enabling the farmer to determine with some degree of accuracy the methods which under given conditions will bring returns approaching the maximum from both the pigs and the land used in growing the forage.—*R. C. Thomas.*

1572. Rowney, L. F. **Trials of grasses and fodder plants. Glen Innes experiment farm.** Agric. Gaz. New South Wales 31: 799–803. 1920.—The following grasses were under trial: *Andropogon intermedius* (native), *A. affinis* (native), *Bromus japonicus, Festuca arundinacea, Schedonorus Hookerianus* (native), *Danthonia semiannularis* (native), *Dactylis glomerata, Phalaris bulbosa, Lolium perenne, Deyeuxia coarctata, Avena elatior* [*Arrhenatherum elatius*], and *Phleum pratense.* Best results seemed to be obtained from *Bromus, Phalaris, Lolium,* and *Avena.*—Among several alfalfas (lucernes), "Montana" seemed to give best results. Alfalfa seed does not set at this station.—Satisfactory results were secured from *Melilotus alba, Trifolium pratense perenne* and *Poterium sanguisorba.*—*L. R. Waldron.*

1573. Rumker, K. V., und R. Leidner. **Die Sortenanbauversuche im Jahre 1918. [Variety tests in 1918.]** Landw. Jahrb. 35: 327–340. 1919.—A report on variety tests with oats, barley, wheat, soy beans, bush beans, and millet.—*A. J. Pieters.*

1574. Saillard, Émile. **La betterave à sucre pendant la guerre. [Sugar beets during the war.]** Compt. Rend. Acad. Sci. Paris 170: 1460–1461. 1920.—A study of analyses of sugar beets as affected by meteorological and other conditions in France during 20 years. The amount of sugar per acre, as shown by analyses during October of each year, increased until in 1919 it reached 17.57 per cent. The difference is held to be due to the scarcity of fertilizers, especially nitrogenous, during the war.—*C. H. Farr.*

1575. Schmidt, H. **Anforderungen der Landwirtschaft an die Botanik. [Demands of agriculture on botany.]** Jahresber. Ver. Angew. Bot. 16: 31–37. 1918.

1576. Schneidewind, W. **Parzellengröszen-Versuche. Untersuchungen über die Brauchbarkeit verschieden grosser und verschieden angelegter Parzellen bei Düngungsversuchen und die Wahrscheinlichkeitsrechnung. [Plot experiments. Investigations concerning the usefulness of plots of varying size and laid out in various ways in fertilizer experiments and the calculation of probabilities.]** Arbeit. Deutsch. Landw. Ges. 296. *6–51.* 1919.—The author reports the results of five years' work, undertaken to determine the relative accuracy of results with plots varying in size from 9 and 100 square meters to 200 square meters. Of the 9 square meter plots there were two series, one with uncultivated strips 80 cm. wide surrounding each plot, the other with plots adjoining one another. The fertilizers used were sodium nitrate and calcium-ammonium nitrate. The author concludes: (1) Plots with uncultivated intervening spaces are unreliable, the yields being too high and the effect of the fertilizers too little noticeable. (2) The plots when adjoining, irrespective of size, gave corresponding yields. (3) When the fertilizer is so distributed as to be placed within the outer three drill rows, its effect is not apparent in the adjoining plot. (4) The differences between minimum and maximum yields was greatest in the 9 square meter plots, due largely, however, to the fact that the number of small plots was larger than that of the large plots. (5) The probability calculations showed that where considerable yield differences occurred these were a true measure of the effect of the fertilizer. Where small increases are secured the results are uncertain.—*A. J. Pieters.*

1577. Shepherd, A. N. **Farmers' experiment plots. Lucerne top-dressing trials, 1919–20. Murrumbidgee irrigation areas.** Agric. Gaz. New South Wales 31: 609–616. *3 fig.* 1920.—Results indicate that lucerne responds profitably to increased care in culture. Profits resulted from using superphosphate as a top dressing.—*L. R. Waldron.*

1578. Slate, William L. Jr., and Benjamin A. Brown. **Fertilizers for potatoes.** Storrs [Connecticut] Agric. Exp. Sta. Bull. 106. *39–48.* 1920.—During 4 years (1915–1918) varying amounts of potash, phosphoric acid, and ammonia have been applied to potatoes. As much as 80 pounds of potash per acre has given profitable increases in yield. Manuring the land the previous year has not reduced the need of potash. It appears that 100–120 pounds of phosphoric acid per acre are sufficient. Fields not recently manured need 100 pounds of ammonia per acre; this may be reduced where manure has been used recently.—*Henry Dorsey.*

1579. Spafford, W. J. **Agricultural experiments—linseed for seed.** Jour. Dept. Agric. South Australia 23: 754–756. 1920.

1580. Spafford, W. J. **Experimental farms harvest reports, Turretfield.** Jour. Dept. Agric. South Australia 23: 13–29. 1920.—A report of the 1919 harvest with statistical data comparing the grain and forage crops with the rainfall during a series of years. The results of wheat varieties in fertilizer, rotation, and cultural tests are similarly compared.—*Anthony Berg.*

1581. Spafford, W. J., and E. A. Bristow. **Experimental farm harvest reports, Booborowie.** Jour. Dept. Agric. South Australia 23: 907–914, 1020–1030. 1920.—Yield report of grain crops from variety, cultural, and fertilizer experimental tests. The data in most cases are given in statistical form, comparing yields and the rainfall through a series of years.—*Anthony Berg.*

1582. Spafford, W. J. **Agricultural experiments.—Report for year 1919–20.** Jour. Dept. Agric. South Australia 23: 593–602. 1920.—The results of experiments conducted at Hammond, Butler, Wilkawatt, and Yelanna, and dealing with cultivation methods relating to dry farming, including wheat variety trials, rotation, and fertilizer tests.—*Anthony Berg.*

1583. Spragg, Frank A. **The spread of Rosen rye.** Jour. Heredity 11: 42–44. *1 fig.* 1920.—A brief account of the spread of Rosen rye, as shown by the number of bushels from Michigan sold to the various states for seed.—*J. H. Beaumont.*

1584. Taylor, E. P. **Uniformity of rules and regulations of potato seed certification.** Monthly Bull. California State Commission Hort. 8: 280–285. 1919.

1585. Thoms, Hermann. **Über Lupinenverwertung. [Utilization of lupines.]** Jahresber. Ver. Angew. Bot. 16: 38–60. 1918.

1586. Thorne, C. E. **Palatable sirup from sugar beets.** Monthly Bull. Ohio Agric. Exp. Sta. 5: 294. 1920.

1587. Trowbridge, P. F. **Report of Langdon Substation, 1914 to 1919.** North Dakota Agric. Exp. Sta. Bull. 134. *31 p., 8 fig.* 1920.—The data presented were secured by E. D. Stewart, superintendent of the substation until his death. Wheat after corn and wheat after clean fallow yielded the same. The corn crop was not generally successful.—In fertilizer studies, barnyard manure alone and with minerals increased wheat yields from 2.4 to 4.6 bushels per acre over the check yield of 20.5. Green manure (field peas) used with minerals was less successful.—Yields of grain were larger upon the deeply plowed plats.—Sunflowers outyielded maize 710 pounds per acre, or 27 per cent, in air-dry material. Slender wheatgrass, *Agropyron tenerum*, was found valuable for alkali land.—Upon the average, for 11 years, Kubanka durum has outyielded all other varieties of wheat. Yields of varieties of oats, barley, and potatoes are given.—*L. R. Waldron.*

1588. Wellington, R. **The uselessness of hill selection under conditions where rapid degeneration or "running out" is prevalent.** Proc. Amer. Soc. Hort. Sci. 16: 175–179 (1919) 1920. —Work over a series of years on hill selection of potatoes showed conclusively that the practise is useless in fields where degeneracy is prevalent. Degeneracy occurred in the progeny of both high and low yielding hills. Low yielding hills often produced better than high yielding ones. In 1916, 17 out of 23 varieties gave an increased yield in favor of the low yielding hills. Transfer of degenerating strains for a year to localities farther north seems to increase the vigor of the strain.—*H. A. Jones.*

BIBLIOGRAPHY, BIOGRAPHY, AND HISTORY

Neil E. Stevens, *Editor*

1589. Adams, Henry. **The degradation of the democratic dogma.** *317 p.* The Macmillan Co.: New York, 1919.—The introduction by Brooks Adams details some of the activities of John Quincy Adams in behalf of science. Among these are some of botanical interest, notably his project (p. 53) to preserve a forest of live-oak near Pensacola in order that the species might be studied.—*Neil E. Stevens.*

1590. Anonymous. **Cotton growing.** Nature 105: 793. 1920.—A note on the "future organization" of the Empire Cotton Growing Committee of the Board of Trade, which proposes to support both research and the training of men in pure science, in which it hopes to secure the co-operation of all the plant-using industries.—*O. A. Stevens.*

1591. Anonymous. **International Catalog of Scientific Literature. M. Botany. Fourteenth annual issue.** *753 p.* London, 1919.—Literature received between September, 1914, and May, 1916. "The primary divisions adopted correspond to the recognized branches of the science of botany." "It is considered essential that all work on fossil plants should appear in the botany scheme." The primary divisions in the schedule of classification for Botany are: general; morphology, embryology and cytology; physiology; pathology; evolution; taxonomy; geographic distribution.—Author index, 259 pages; subject index, 439 pages. —*D. Reddick.*

1592. Anonymous. **Mary Sophie Young.** Bot. Soc. Amer. Misc. Publ. 76. *81–82.* 1920. —An appreciation of the life and work of the late Dr. Young of the University of Texas.—*J. R. Schramm.*

1593. Anonymous. **William Gilson Farlow.** Bot. Soc. Amer. Misc. Publ. 76. *79–80.* 1920.—An appreciation of the life and work of the late Professor Farlow, of Harvard University.—*J. R. Schramm.*

1594. Britten, J. **Some early Cape botanists and collectors.** Jour. Linn. Soc. London Bot. 45: 29–51. *Pl. 4.* 1920.—A consideration of the following botanists and collectors of Cape Colony whose work is represented in the Department of Botany of the British Museum: Justus Heurnius; Paul Hermann; Thomas Bartholinus; Henricus Bernardus Oldenlandius; John Starrenburgh; John Foxe; Franz Kiggelaer; Monsieur Des Marets; Franz Pehr Oldenburg; Andreas Auge; Francis Masson; Carl Pehr Thunberg; James Niven; William Paterson; Anton Pantaleon Hove; William Roxburgh; James Wiles; James Lind; James Robertson; David Nelson; Robert Brown; Banks; and Solander. A portrait of Masson is included.—*A. J. Eames.*

1595. Fairchild, D. **The dramatic careers of two plantsmen.** Monthly Bull. Dept. Agric. California 8: 585–589. 1919.—Frank N. Meyer and Aaron Aaronsohn.—*E. L. Overholser.*

1596. Harvey-Gibson, R. J. **Outlines of the history of botany.** *274 p.* A. & C. Black, Ltd.: London, 1919.—A course of lectures for students at the University of Liverpool.—*H. L. Shantz.*

1597. Jones, L. R. **Our journal, Phytopathology.** Phytopath. **9**: 159–164. 1919.—A record of the American Phytopathological Society to the celebration of its tenth anniversary. —*J. G. Dickson.*

1598. L [acaita], C. C. [Rev. of: Sargeaunt, John. **The trees, shrubs, and plants of Virgil.** *vii + 149 p.* B. H. Blackwell: Oxford (1920).] Jour. Botany **58**: 253–256. 1920.

1599. Laupert. **Die Gründung einer Gesellschaft zur Förderung des Zuckerrübenbaues und der Zuckerindustrie in Lettland.** [**The establishment of an association for encouraging sugarbeet culture and the sugar industry in Lettland.**] Mitteil. Deutsch. Landw. Ges. **35**: 603–605. 1920.—A report of the organization of this society presented on behalf of F. Höltzermann.—*A. J. Pieters.*

1600. Lyman, G. R. **The advisory board of American Plant Pathologists.** Phytopath. **9**: 202–206. 1919.

1601. Merrill, George P. **Contributions to a history of American state geological and natural history surveys.** U. S. Nation. Mus. Bull. 109. *550 p., 37 pl.* 1920.—This work contains incidental references to prominent botanists who were associated with the surveys. As these are not mentioned in the index the page numbers are included here following the names: J. C. Arthur 249, E. E. Baldwin 208, W. J. Beal 226, N. L. Britton 319, W. M. Canby 539, J. M. Coulter 81, F. V. Coville 21, M. A. Curtis 370, 374, Chester Dewey 155, Amos Eaton 327, George B. Emerson 155, George L. Goodale 135, Leo Lesquereux 15, 59, 75, 82, 451, Charles Mohr 11, J. S. Newberry 35, 69, 319, 531, C. S. Rafinesque 101, 102, C. S. Sargent 539, John Torrey 329.—*Neil E. Stevens.*

1602. Ramsbottom, J. **James William Helenus Trail. (1851–1919.)** Trans. British Mycol. Soc. **6**: 297–298. 1920.—Professor Trail was professor of botany at Aberdeen, Scotland, and published numerous papers on systematic mycology.—*W. B. McDougall.*

1603. Roberts, Herbert F. **The founders of the art of breeding.** Jour. Heredity **10**: 229–239, 257–270. *1 fig.* 1919.—Carl Friederich von Gärtner, John Goss, William Herbert, Thomas Andrew Knight, Alexander Seton, and A. F. Wiegmann, Charles Darwin, Wilhelm Olbers Focke, Duchartre, D. A. Godron, Henri Lecoq, Charles Naudin, Augustin Sageret, B. Verlot, Henri de Vilmorin, Max Wichura. [See also Bot. Absts. 5, Entry 90, 91.]—*M. J. Dorsey.*

1604. Shear, C. L. **First decade of the American Phytopathological Society.** Phytopath. **9**: 165–170. 1919.—A sketch of the Society containing excerpts from the secretary's minutes, committee reports, and letters.—*J. G. Dickson.*

1605. Stevens, F. L., L. H. Pammel, and Mel T. Cook. **Byron David Halsted. June 7, 1852–August 28, 1918.** Amer. Jour. Bot. **7**: 305–317. *Portrait.* 1920.—A brief biography of Professor Halsted, to which is appended a list of his publications, 411 in number.—*E. W. Sinnott.*

1606. Tilden, Josephine E. **Bibliography of the literature relating to the Pacific Ocean algae and to the freshwater algae of the countries bordering upon the Pacific Ocean.** *58 p.* (Separately printed) 1920.—A reprint in pamphlet form from *Index Algarum Universalis*: A universal card index of the marine, freshwater, epiphytic, and parasitic algae of the world. A supplement includes special bibliographies relating to fisheries, economic algae, geology, and fertilizer algae; and it is noted that the bibliographies relating to diatomaceous earth and to fossil algae are too large for reprinting.—*C. E. Allen.*

BOTANICAL EDUCATION

C. Stuart Gager, *Editor*
Alfred Gundersen, *Assistant Editor*

1607. Anonymous. **Toronto botanic garden.** Brooklyn Bot. Gard. Rec. 9: 127. 1920.—News item of plans being developed for the establishment of a botanic garden in Toronto, Canada, by the University of Toronto in cooperation with the municipal authorities and the Provincial Government.—*C. S. Gager.*

1608. Bower, F. O. **Botany of the living plant.** *580 p., 447 fig.* $10.00. Macmillan & Co., Ltd.: London, 1919.—Expansion of course in elementary botany in Glascow University. Elementary and fundamental held as equivalent terms. Plant presented as living, growing, self-nourishing, self adapting creature. Angiosperms 300 pages, seed, cells, tissues, leaf, root, water-relation, nutrition, etc., followed by gymnosperms and lower plants. General conclusion: Sex and heredity, alternation of generations and the land-habit. Appendix: A. Floral construction in angiosperms; B. Vegetable food-stuffs.—*A. Gundersen.*

1609. Clute, Willard N. **Plant names and their meanings.** Amer. Bot. 26: 116–124. 1920.

1610. Gager, C. Stuart. **Heredity and evolution in plants.** *xv + 265 p., 112 fig.* P. Blakiston's Son & Co.: Philadelphia, 1920.—In text-book form. Thirteen chapters: life history of fern (2), fundamental principles, heredity, experimental study of heredity, evolution, Darwinism, experimental evolution, the evolution of plants (2), geographical distribution, paleobotany. Bibliography.—*C. S. Gager.*

CYTOLOGY

Gilbert M. Smith, *Editor*
Geo. S. Bryan, *Assistant Editor*

1611. Anonymous. **Carriers of the germ plasm.** Jour. Heredity 10: 422. *Fig. 21.* 1919.

1612. Guilliermond, A. **Sur la structure de la cellule vegetale. [On the structure of the vegetable cell.]** Compt. Rend. Acad. Sci. Paris 170: 1515–1518. 1920.—Cytological methods show that all cells contain mitochondria; while studies on living cells show they are not artifacts; but these studies cannot be expected to contribute much as to their nature. The author applies term chondriosome to plastid forming bodies, while Dangeard considers vacuolar systems chondriosomes.—*C. H. Farr.*

1613. Hartridge, H. **Economical dehydrating and clearing agents.** Jour. Physiol. [London] $54^{1,2}$: viii–ix. 1920.—Amyl alcohol used in place of absolute alcohol and clove oil following 95 per cent alcohol and followed by Canada balsam in xylol; also for passing to No. 1 petrol for embedding in paraffin. No. 1 petrol used successfully in place of xylol for paraffin imbedding and dissolving paraffin from mounted sections.—*Ernest Shaw Reynolds.*

1614. Licent, E. **Sur l'emploi, comme fixateur, des mélanges de formol et de composés chromiques. [The use of mixtures of formalin and chromic compounds as fixatives.]** Compt. Rend. Acad. Sci. Paris 170: 1518–1521. 1920.—For the past 15 years the writer has used successfully the following formulae: (1) 1 per cent chromic acid 80 cc.; commercial formalin 15 cc.; glacial acetic acid 5 cc. (2) the same as (1) but using 2 per cent chromic acid. (3) 2 per cent chromic acid 6 cc.; commercial formalin 30 cc.; crystallizable acetic acid 5 cc. (4) 2 per cent chromic acid 50 cc.; commercial formalin 30 cc.; crystallizable acetic acid a few drops; 10 per cent potassium bichromate 10 cc.; 10 per cent nickel acetate 10 cc. (5) Same as (4) with the addition of 10 cc. of saturated aqueous solution of mercuric chloride. Formulae

1 and 2 are used in young tissues, meristem, and ordinary adult tissue; 3 is used on resistant tissues; and 4 and 5 for mitochondria. The formalin is usually added just before using. Material may be left permanently in the fixative after adding a little water.—*C. H. Farr.*

1615. Mangenot, G. **A propos du chondriome des Vaucheria. [The chondriome of Vaucheria.]** Compt. Rend. Acad. Sci. Paris **170**: 1458–1459. 1920.—In living material granules of various sizes are found among the chloroplasts, bodies that reach the size of chloroplasts and smaller motile bodies consisting of lipoids. In addition there are round grains, of a dead appearance, mingled with short rods (the true mitochondria) that are always larger than the fat bodies. Metachromatic corpuscles may also be distinguished by intra-vital stains.—*C. H. Farr.*

1616. Mangenot, G. **Sur l'évolution des chromatophores et le chondriome chez les Floridees. [The development of the chromatophores and chondriomes of the Florideae.]** Compt. Rend. Acad. Sci. Paris **170**: 1595–1598. *Fig. 1–11.* 1920.—In the Lemaneaceae the rhodoplasts are elongated, the smaller ones resembling chondrioconts, but containing the pigment material. These small rhodoplasts are found in the carpogonium, but after fertilization they fragment into chondrisomal structures which persist until the formation of the young carpospores, when they enlarge and the pigment reappears in the mature spore. Another type of chondriosome remains unchanged throughout the life history of the alga.—*C. H. Farr.*

1617. Sharp, Lester W. **Somatic chromosomes in Tradescantia.** Amer. Jour. Bot. **7**: 341–354. *2 pl.* 1920.—Somatic chromosomes from the root tip of *Tradescantia virginiana* were studied. The entire cycle of chromatin history is described in detail, beginning with the metaphase. The author is particularly concerned with the time and method of chromosome splitting and with the bearing of the observed facts on the problem of chromosome reduction. During telophase the chromosomes are transformed by irregular vacuolation into alveolar-reticulate structures, and in the resting reticulum the limits of the constituent chromosomes may sometimes still be made out. In prophase, the chromosomes separate from one another and each gives rise to a single slender chromatic thread in which the definitive split develops as a new formation. This splitting has no relation to the vacuolation during telophase, at which time the chromosomes must be regarded as single. Contrary to the conclusions of some previous workers, therefore, splitting is a phenomenon of the prophase rather than of the telophase. No evidence has been found that chromosome splitting is a division of smaller chromatic units. Chromosome behavior during somatic telophase does not provide a key to the interpretation of the reduction process.—*E. W. Sinnott.*

FORESTRY AND FOREST BOTANY

Raphael Zon, *Editor*

J. V. Hofmann, *Assistant Editor*

1618. [Anonymous.] A. B. J. **Australian hardwoods.** [Rev. of: Baker, R. T. **The hardwoods of Australia and their economics.** *xvi + 522 p., 1 pl.* Technical Education Series No. 23. The Technological Museum: Sydney, 1919.] Nature **105**: 802–803. 1920.—Australia has probably the largest variety of hardwoods in the world, but representing less than 500 species. Nearly half of these belong to *Eucalyptus.* which supplies the bulk of hardwoods for commercial purposes. Author emphasizes use of color in identification. Reviewer has compared some of the plates with specimens and finds the representation good.—*O. A. Stevens.*

1619. Anonymous. **Awbury Arboretum.** Brooklyn Bot. Gard. Rec. **9**: 23–24. 1920.—Digest of article in Bull. Geog. Soc. Philadelphia (July, 1919).—See Bot. Absts. 7, Entry 77.

1620. Anonymous. **The British Empire forestry conference.** Nature 105: 759–760. 1920. —Commission organized Nov. 1919, met in London July 7–22. Proposal to organize an Imperial Forestry Bureau to act as a clearing house of information; to establish a research institute to deal with cultural problems and another for utilization problems. Conference held that an institution for training forest officers should be established.—*O. A. Stevens.*

1621. Anonymous. **Gymnospermic history.** [Rev. of: Seward, A. C. **Fossil Plants: A text-book for students of botany and geology.** Vol. 4, Ginkgoales, Coniferales, Gnetales. *xvi + 543 p.* University Press: Cambridge, 1919.] Nature 105: 97–98. 1920.—See Bot. Absts. 7, Entries 379, 383.

1622. Anonymous. **Oil, sugar and alcohol from an African tree.** Sci. Amer. 123: 175. 1920.—A brief note concerning the sump tree, *Balanites aegyptiae* Del.—*Chas. H. Otis.*

1623. Anonymous. **State to grow nursery trees.** Amer. Nurseryman 32^{6}: 120. 1920.—The Pennsylvania department of forestry plans to grow several thousand young forest trees in nurseries at various state institutions. After the trees are 3 years old they will be planted by private interests and by the department of forestry.—*J. H. Gourley.*

1624. Berry, E. W. **The ancestors of the sequoias.** Sci. Amer. Monthly 2: 207–208. 1920.—See Bot. Absts. 7, Entry 385.

1625. Bertrand, Gabriel. **Des conditions qui peuvent modifier l'activité de la chloropicrine vis-à-vis des plantes supérieures. [The conditions which frequently modify the effect of chloropicrine upon the higher plants.]** Compt. Rend Acad. Sci. Paris 170: 952–954. 1920.—See Bot. Absts. 7, Entry 439.

1626. Burns, George P. **Eccentric growth and the formation of redwood in the main stem of conifers.** Vermont Agric. Exp. Sta. Bull. 219. *1–10, Pl. 4, 10 fig.* 1920.—See Bot. Absts. 7, Entry 318.

1627. Chaney, Ralph W. **The flora of the Eagle Creek formation.** Cont. Walker Mus. 2^{5}: 115–182. *Pl. 5–22.* 1920.—See Bot. Absts. 7, Entry 389.

1628. Corrêa Mendes, F. C. **A panheira. [Silk cotton.]** Bol. Agric. Nova Goa [Portuguese East India] 1: 37–44. 1919.—Three species of trees yielding the product known as silk cotton or kapok are briefly described, *Bombax malabaricum* white or red silk cotton tree, *Cochlospermum gossypium* yellow silk cotton tree, and *Eriodendron anfractuosum* (*Ceiba pentandra*) silk cotton tree or kapok. A general discussion follows covering seed collection, nurseries, formation of plantations, collecting the cotton, its preparation for market, uses and yields.—*John A. Stevenson.*

1629. Corrêa Mendes, F. C. **Viveiros. [Nurseries.]** Bol. Agric. Nova Goa [Portuguese East India] 1: 45–49. 1919.—A popular discussion of nurseries for forest tree seedlings, including choice of site, preparation of the soil, cultural directions, and transport of the plants when ready for final planting.—*John A. Stevenson.*

1630. Coville, Frederick V. **The influence of cold in stimulating the growth of plants.** Proc. Nation. Acad. Sci. [U. S.] 6: 434–435. 1920.—See Bot. Absts. 7, Entry 434.

1631. Cowell, Arthur Westcott. **Awbury Arboretum Address.** Bull. Geog. Soc. Philadelphia 17: 98–102. July, 1919.—See Bot. Absts. 7, Entries 88, 1619.

1632. Dacy, G. H. **How a state may grow a timber supply.** Sci. Amer. 123: 199. *3 fig.* 1920.—An article dealing with a bill submitted to the state legislature of Massachusetts containing a practical and profitable plan for remedying the timber crisis in that state.—*Chas. H. Otis.*

1633. Farwell, Oliver A. **Notes on the Michigan Flora, II.** Michigan Acad. Sci. Ann. Rept. **21**: 345–371. 1919.—See Bot. Absts. 7, Entry 487.

1634. Gibbs, Vicary. **Oaks at Aldenham.** Jour. Roy. Hort. Soc. **45**: 155–233. *Fig. 15–26.* 1919.—A popular article giving the characteristics and behavior of over 75 species of *Quercus*, including some hybrids and varieties, brought from Asia, America, and continental Europe. Nearly all the types described are growing on the grounds of the author. It was found that trees from the nursery row grew especially well when planted in leaf mould underlaid with a thick bed of forest leaves.—*J. K. Shaw.*

1635. Grabham, Michael. **The cluster pine.** Nature **105**: 675–676. 1920.—*Pinus pinaster* was probably introduced into Madeira about 1770, and for general purposes is the most serviceable conifer yet seen in Madeira. Seed is sown in November or December with wheat, and yields stakes in 4 or 5 years and firewood in 12 or 15. The species does not sprout from the stump. Reference is made to some other conifers in Madeira.—*O. A. Stevens.*

1636. Haines, H. H. **Indian species of Carissa.** Indian Forester **45**: 375–388. *Pl. 17–20. 7 fig.* 1919.—See Bot. Absts. 7, Entry 520.

1637. Hall, Cuthbert. **On a new species or form of Eucalyptus.** Proc. Linnean Soc. New South Wales **43**: 747–749. *Pl. 75.* 1918.—See Bot. Absts. 7, Entry 521.

1638. Hauch, L. A. **Proveniensforsög med Eg. II.** [**Tests of climatic varieties of oak.**] Forst. Forsögsv. Danmark **5**: 195–224. *Pl. 6.* 1920.—Twelve experimental plantations have been made with oaks from Denmark, Holland, Russia, Moravia, Hungary, Slavonia, South Austria, and Hanover. These were started in 1909. The results to date show that none of the introduced varieties can be used with absolute certainty and that the oaks of Danish origin are best suited for local use. The oaks from native seed are more robust and vigorous than those of foreign origin, their manner and time of development render them less liable to attack by mildew; the non-native oaks are generally more straight than the Danish variety; they develop more summer shoots which are long and slender and with diminutive buds strongly infected with mildew; often they do not ripen at all and are therefore less frost hardy. Leaves of the Danish oaks develop later in the spring and discolor earlier in the fall.—*J. A. Larsen.*

1639. Heinricher, E. **Ein Versuch Samen, allenfalls Pflanzen, aus der Kreuzung einer Laubholzmistel mit der Tannenmistel zu gewinnen.** [**An attempt to secure seeds, perhaps plants, from the cross between the mistletoe of deciduous trees with that of the Coniferae.**] Ber. Deutsch. Bot. Ges. **37**: 392–398. Dec., 1919.

1640. Helms, Johs., og Paul Wegge. **Prikleforsög paa Silkeborg og Vemmetofte Skovdistrikter.** [**Transplanting tests at Silkeborg and Vemmetofte forests.**] Forst. Forsögsv. Danmark **5**: 225–292. *Pl. 41.* 1920.—Experiments in grading and pruning transplant stock of *Abies normandica* and *Picea excelsa* were carried out from 1915 to 1917. The large plants of spruce resist drought better than do the medium-sized ones and these in turn better than the smallest ones. Unpruned stock always gives the largest percentage of usable plants. Differences in survival of the grades are less marked in favorable than in dry seasons. Light root pruning produces practically no difference in a favorable season, but may result in much loss of pruned stock in a dry summer and may result in poor growth. If the second season is moist the tops develop most, whereas the root growth is proportionately larger in a dry season. Vigorous tamping of the soil after transplanting is useless. The third (smallest) class of seedlings should be discarded. Stock will stand more pruning on clay soil than on sandy soil,—on the latter only the long straggling roots should be cut.—*J. A. Larsen.*

1641. Holten, A. **To-aarig opbevaring af agern.** [**Storing acorns two years.**] Dansk Skovforenings Tidsskr. **5**: 191–198. 1920.—A considerable quantity of acorns which had been stored in the fall of 1918 gave 40 per cent germination in 1920. The author concludes

that in order to preserve the acorns two years it is necessary to use Hauch's method the first winter and to store them in dry sand the following spring and at such depth that the temperature will remain fairly constant.—*J. A. Larsen.*

1642. Howard, A. O. **The empire timber exhibition.** Nature 105: 691–693. 1920.—Apparently a temporary exhibit (made "at time of British Empire forestry conference"). Exhibits from: British East Africa, most important species being *Juniperus procera*—used for pencils; the Gold Coast, species of *Khaya* (African mahoganies), Odum (*Chlorophora excelsa*), Karkoo (*Lofhira procera*); Nigeria, various sorts; Western Australia, special mention of Jarrah (*Eucalyptus diversicolor*) and Karri (*E. marginata*); Canada, especially Douglas fir (*Pseudotsuga Douglasii*), Sitka or silver spruce (*Picea sitchensis*) and basswood (*Tilia americana*); British Guiana, many of value which are as yet little known; Indian Empire, especially decorative woods; United Kingdom, about seventy varieties. Several other (British) countries exhibited woods.—*O. A. Stevens.*

1643. Jaccard, P. **Inversion de l'excentricité des branches produite experimentalement. [The experimental inversion of the eccentricity of branches.]** Rev. Gén. Bot. 32: 273–281. *2 pl., 1 fig.* 1920.—See Bot. Absts. 7, Entry 431.

1644. Koidzumi, Geniti. **Contributiones ad Floram Asiae Orientalis. [Contributions to the flora of Eastern Asia.]** Bot. Mag. Tôkyô 33: 217–223. 1919.—See Bot. Absts. 7, Entry 527.

1645. Lecomte, Henri. **Sur les principaux caractères de structure des bois. [The principal characters in wood structure.]** Bull. Mus. Hist. Nat. Paris 26: 166–171. 1920.—See Bot. Absts. 7, Entry 326.

1646. Leiningen-Westerburg (Graf zu). **Rauchschäden und einschlagige bodenkundliche Fragen. [Smoke injury and related matters of soil science.]** Forstwiss. Centralbl. 42: 18–93. 1920.—See Bot. Absts. 7, Entry 459.

1647. Miyoshi, Manabu. **Über der Erhaltung einer neuen wildwachsenden hängenden Varietat des Kastanienbaumes als Naturdenkmal. [Concerning a new wild chestnut with weeping branches and its preservation as a natural monument.]** Bot. Mag. Tôkyô 33: 185–188. *1 photo.* 1919.—See Bot. Absts. 4, Entry 452.

1648. Moreillon, M. **Influence de l'ombrage sur la valeur des gazons dans les pâturages boisés. [The influence of shade upon the value of the grasses in wooded pastures.]** Jour. Forest. Suisse 70: 131–142. 1919.—See Bot. Absts. 7, Entry 39.

1649. Moulton, R. H. **Wood that is stronger than steel.** Sci. Amer. 123: 204, 212. *5 fig.* 1920.—How thin veneers and water-proof glue have been utilized in building a new industry.—*Chas. H. Otis.*

1650. Mount, H. A **In the wake of the woodsman.** Sci. Amer. 123: 122, 137–138. *5 fig.* 1920.—Popular.—*Chas.. H. Otis.*

1651. Mount, H. A. **What about our forests?** Sci. Amer. 123: 62, 73–74. *3 fig.* 1920.—Popular.—*Chas. H. Otis.*

1652. Mount, H. A. **What is wrong with our paper supply?** Sci. Amer. 122: 674, 688. *1 fig.* 1920.

1653. Murrill, W. A. **Where chocolate comes from.** Sci. Amer. 122: 626. *5 fig.* 1920. —How the cacao bean, *Theobroma*, is grown and made into cocoa and chocolate.—*Chas. H. Otis.*

1654. Ness, H. [misprinted as N. Hess]. **Experiences in plant hybridization.** Proc. Amer. Soc. Hort. Sci. 16: 52–60. (1919) 1920.—See Bot. Absts. 7, Entry 228.

1655. Niklas, H. **Die Bedeutung der Geologie für die land- und forstwirtschaftliche Bodenkunde. [The significance of the science of geology with relation to agricultural and forest soil science.]** Naturwiss. Zeitschr. Forst- u. Landw. **18**: 22–35. 1920.—See Bot. Absts. **7**, Entry 478.

1656. Niklas, H. **Eine landwirtschaftliche Bodenübersichtskarte von Bayern. [An agricultural soil survey chart for Bavaria.]** Naturwiss. Zeitschr. Forst- u. Landw. **18**: 62–65. 1920. —See Bot. Absts. **7**, Entry 479.

1657. Ostenfeld, C. H. **Bemaerkninger om Danske traeers og buskes Systematisk udvidelse. [Systematic distribution of trees and shrubs in Denmark.]** Dansk Skovforenings Tidsskr. **5**: 164–182. *Pl. 5.* 1920.—The Danish basswood is not generally a forest tree though it is among the earliest recognized arborescent species in the country. Three species of basswood occur;—i. *Tilia platyphylla* Scop., (*T. grandifolia* Ehrh.). This species is here on the northern limit of its distribution. It entered Denmark during the warmer part of the postglacial period and is now retrogressive both in Denmark and Sweden. ii. *Tilia cordata*, Mill. (*T. ulmifolia* Scop.; *T. microphylla* Vent.; *T. parvifolia* Ehrh.). This is hardier and more of a forest tree and of more general distribution than the former. iii. *Tilia cordata* × *platyphylla*. (*T. intermedia* D. b.; *T. europea* L.) A hybrid of rapid growth, vigorous but of limited distribution. It is used chiefly for shade trees and for parks.—*J. A. Larsen.*

1658. Rock, Joseph F. **One government forest.** Hawaiian Forester and Agric. **16**: 39–40. *3 pl.* February, 1919.—See Bot. Absts. **7**, Entry 493.

1659. Rowland, J. T. **Pulp wood from Labrador.** Sci. Amer. **123**: 156. *3 fig.* 1920.—Descriptive of a belt of timberland on the Labrador coast some 400 miles long, which is accessible by navigable waterways to an average depth of about 30 miles. The timber consists chiefly of spruce (*Picea nigra*) and tamarack (*Larix americana*) from a few inches to two feet in diameter at the butt; it is suitable for pulp wood but of little or no value for any other purpose.—*Chas. H. Otis.*

1660. Sandmo, J. K. **Fremtidens Träslag. [Timber trees for the future.]** Tiddskr. Skogbruk **28**: 154–165. *Pl. 3.* 1920.—Observations on *Pinus sylvestris*, *Pinus gallica*, and *Picea excelsa* in the Pyrenees Mountains lead the author to conclude that *P. excelsa* is better suited for higher elevations in Norway than *Pinus sylvestris*, and that *P. gallica* should be tried out at higher elevations in Norway in an effort to find a species which will advance the natural timberline.—*J. A. Larsen.*

1661. Schuster, Matthäus. **Wie soll der Land- und Forstwirt geologische Karten lesen? [How shall the agriculturist and forester read geological charts?]** Naturwiss. Zeitschr. Forst- u. Landw. **18**: 10–22. *1 fig.* 1920.—See Bot. Absts. **7**, Entry 480.

1662. Secrest, Edmund. **Fire protection for forest lands.** Monthly Bull. Ohio Agric. Exp. Sta. **5**: 281–286. 1920.—Some five or six counties of southeastern Ohio are specially adapted for forest purposes because they cannot be profitably cleared for tillage or pasture. It is estimated that 750,000 acres of this land are menaced by fire and that 300,000 acres of woodland burn over at 1–10 year intervals. Protection against fire is more essential than planting. The general code of Ohio contains no enactments designed to control the evil. Legislation in this respect is urgently needed. Suggestions are made for the protection of timber lands of Ohio against forest fires, making the township the logical unit.—*R. C. Thomas.*

1663. Springer, J. F. **The twentieth-century lumber-jack.** Sci. Amer. **123**: 34, 48–50. *4 fig.* 1920.—Describes modern methods and machines.—*Chas. H. Otis.*

1664. Tiemann, Harry D. **Phenomena of drying wood.** Jour. Franklin Inst. **189**: 645–648. *1 fig.* 1920.—The description of a mechanical device which illustrates the phenomena of normal shrinkage, the "set" or fixation, and the increase in strength and hardness of wood when it loses moisture. [See Bot. Absts. **4**, Entry 476.]—*Ernest Shaw Reynolds.*

1665. Vuillemin, P. **L'amphigonelle et la phylogénie des amentales.** [The "amphigonelle" and the phylogeny of the Amentales.] Ann. Sci. Nat. Bot. X, 1: 139–200. 1919.—See Bot. Absts. 7, Entry 336.

1666. Webster, A. D. **The systematic afforestation of Great Britain.** Jour. Roy. Hort. Soc. 45: 278–288. 1919..

1667. Zeller, S. M. **Humidity in relation to moisture imbibition by wood and to spore germination on wood.** Ann. Missouri Bot. Gard. 7: 51–74. *1 pl., 5 fig.* 1920.—See Bot. Absts. 7, Entry 400.

GENETICS

George H. Shull, *Editor*
James P. Kelly, *Assistant Editor*

1668. Agar, W. E. **The genetics of a Daphnia hybrid during parthenogenesis.** Jour. Genetics 10: 303–330. *3 fig.* Dec., 1920.—Attempts to get intergeneric crosses between *Daphnia* and *Simocephalus* failed. Reciprocal hybrids were obtained between *Daphnia obtusa* and *D. pulex*, though the percentage of successful matings between parent species was low. Few of the fertilized eggs of hybrid or straight matings hatched. From 21 fertile ephippia from cross-matings hatched, only three young were produced, two of which gave offspring. One was lost after three generations, others were carried ten parthenogenetic generations. Hybrid clones were characterized by (1) excessive production of sexual eggs, (2) excessive production of males, (3) complete sterility of males, (4) incomplete fertility of parthenogenetic eggs (approximately half failed to develop), and (5) probably normal fertility of sexual eggs (when fertilized by males from parent clones).—As a character for study of inheritance author used ratio between body length and length of second abdominal process, and ratio between lengths of second and third abdominal processes. The former (mean) ratio for males of *D. obtusa* of the parent clone was 30.8, for *D. pulex* 6.2, and for the hybrid clone 10.1. The latter ratio for the females of *D. obtusa* was 2.17, for *D. pulex* 2.89, and for the hybrid clone 1.97. The distribution curves of the hybrids while slightly skew (due to environmental factors) were steep curves and showed no tendency toward bi- or multimodality. "There is no evidence of progressive increase in diversity in successive generations, whether measured by the standard deviation or by the extreme range of variation." The conclusion is "that during the parthenogenetic reproduction of these forms, which is not accompanied by reduction of chromosomes, Mendelian segregation does not take place, nor does genetic diversity between parent and offspring normally arise."—*A. M. Banta.*

1669. Anonymous. **A common misconception concerning human heredity.** Jour. Heredity 10: 275. 1919.—Environment produces greater modifications in plant life than in animal, and far greater on simpler animal tissue than on the more complex.—*J. H. Beaumont.*

1670. Anonymous. **Disease proof potatoes.** Florists' Exchange 50: 1067. Nov. 20, 1920.—Certain potato varieties, including Irish Cobbler, are immune to wart disease. No variety, however, has appeared that is resistant to late blight (*Phytophthora*), although some varieties are more resistant than others.—*Richard Wellington.*

1671. Anonymous. **A factor influencing the sex-ratio.** Jour. Heredity 10: 256. June, 1919.—Author shows from the results of Helen Dean King, Morgan, Riddle, Moenkhaus, and Papanicolau that the female has more influence in determining the sex-ratio, though a knowledge of the interactions of the germ-cells must be gained before the problem can be solved.—*J. H. Beaumont.*

1672. Anonymous. **Heredity of cancer.** Jour. Heredity 10: 89. 1919.—Pointing out racial susceptibility and some family susceptibilities to cancer as argument for placing cancer on a heredity basis.—*J. H. Beaumont.*

1673. Anonymous. **Inheritance of continuous and discontinuous variations.** Jour. Heredity 10: 191. April, 1919.—An article pointing out the conclusions of Dr. F. B. Summer in his paper entitled "Continuous variations and their inheritance in *Peromyscus*. III." Amer. Nat. 52: 439–454. Aug.–Sept., 1918 (See Bot. Absts. 1, Entry, 943), which do not support the views of Bateson and de Vries. Summer's case is parallel to that of Castle's hooded rats.—*J. H. Beaumont.*

1674. Anonymous. **Some present aspects of immigration.** Jour. Heredity 10: 68–70. Feb., 1919.—Fourth report of the committee on immigration of the American Genetic Association. The committee finds that the new law, effective May 1, 1917, if properly enforced can become of immense benefit to our future race. The percentage of exclusions due to mental and physical disease has risen due to increased fines, imposed on transportation companies, and to better examination. The committee is of the opinion that a considerable restriction or temporary suspension of alien immigration would have highly desirable eugenic results.—*J. H. Beaumont.*

1675. Anonymous. [German rev. of: Åkerman, Å. **Speltlike bud-sports in common wheat.** Hereditas 1: 116–127. *6 fig.* 1920. (See Bot. Absts. 6, Entry 1565.)] Zeitschr. Pflanzenzücht. 7: 320. Nov., 1920.

1676. Anonymous. [German rev. of: Allard, H. A. **The Mendelian behavior of aurea character in a cross between two varieties of Nicotiana rustica.** Amer. Nat. 53: 234–238. May–June, 1919. (See Bot. Absts. 3, Entry 217.)] Zeitschr. Pflanzenzücht. 7: 320. Nov., 1920.

1677. Anonymous. [German rev. of: Anthony, Stephen, and Harry V. Harlan. **Germination of barley pollen.** Jour. Agric. Res. 18: 525–536. *2 pl., 2 fig.* Feb. 16, 1920. (See Bot. Absts. 4, Entry 2802; 5, Entries 949, 1449.)] Zeitschr. Pflanzenzücht. 7: 320. Nov., 1920.

1678. Anonymous. [German rev. of: Blakeslee, Albert F., and B. T. Avery, Jr. **Mutations in the jimson weed.** Jour. Heredity 10: 111–120. *Fig. 5–15.* Mar., 1919. (See Bot. Absts. 3, Entry 980.)] Zeitschr. Pflanzenzücht. 7: 321. Nov., 1920.

1679. Anonymous. [German rev. of: Broili. **Solanum edinense Berthault, ein für die Landwirtschaft wertvoller Kartoffelbastard. (Solanum edinense Berthault, a potato hybrid valuable for agriculture.)** Deutsch. Landw. Presse 1920: 359–361. 1920.] Zeitschr. Pflanzenzücht. 7: 321. Nov., 1920.

1680. Anonymous. [German rev. of: Collins, G. N., and J. H. Kempton. **Heritable characters of maize. I. Lineate leaves.** Jour. Heredity 11: 3–6. Jan., 1920. (See Bot. Absts. 7, Entry 1737.)] Zeitschr. Pflanzenzücht. 7: 321. Nov., 1920.

1681. Anonymous. [German rev. of: Collins, J. L. **Chimeras in corn hybrids.** Jour. Heredity 10: 2–10. *7 fig.* Jan., 1919 (See Bot. Absts. 2, Entry 930; 3, Entry 2104.)] Zeitschr. Pflanzenzücht. 7: 321–322. Nov., 1920.

1682. Anonymous. [German rev. of: Dorsey, M. J. **A note on the dropping of flowers in the potato.** Jour. Heredity 10: 226–228. *Fig. 19.* May, 1919.] Zeitschr. Pflanzenzücht. 7: 322. Nov., 1920.

1683. Anonymous. [German rev. of: East, Edward M., and Donald F. Jones. **Inbreeding and outbreeding.** *14 x 21 cm., 285 p., 46 fig.* J. B. Lippincott: Philadelphia, 1919. (See Bot. Absts. 4, Entries 571, 2290, 3460; 5, Entries 1695, 1607.)] Zeitschr. Pflanzenzücht. 7: 341–342. Nov., 1920.

1684. Anonymous. [German rev. of: Emerson, R. A. **Heritable characters of maize. II. Pistillate-flowered maize plants.** Jour. Heredity 11: 65–76. *8 fig.* Feb., 1920. (See Bot. Absts. 7, Entry 1745.)] Zeitschr. Pflanzenzücht. 7: 322. Nov., 1920.

1685. Anonymous. [German rev. of: Ernst, A. **Über Parthenogenesis und Apogamie. (On parthenogenesis and apogamy.)** Verhandl. Schweiz. Naturf. Ges. **1919**: 1–20. 1919. Idem. **Über den Ursprung der apogamen Angiospermen. (On the origin of apogamous angiosperms.)** Vierteljahrsschr. Naturforsch. Ges. Zurich **1917**: 336–348. 1917.] Zeitschr. Pflanzenzücht. **7**: 323. Nov., 1920.

1686. Anonymous. [German rev. of: Feenstra-Sluiter, C. **Waarnemingen en Beschouwingen over Bloei Bevruchtung en Zaadvorming bij Cinchona Ledgeriana Moens. (Observations and considerations of flowering, fertilization and seed formation in Cinchona Ledgeriana Moens.)** Mededeel. Kina-Proefsta. 6. *35 p., 20 fig.* 1919. (See Bot. Absts. 4, Entry 986.)] Zeitschr. Pflanzenzücht. **7**: 323–324. Nov., 1920.

1687. Anonymous. [German rev. of: Freeman, G. F. **Linked quantitative characters in wheat crosses.** Amer. Nat. **51**: 683–689. 1917.] Zeitschr. Pflanzenzücht. **7**: 324. Nov., 1920.

1688. Anonymous. [German rev. of: Freeman, G. F. **Producing bread making wheats for warm climates.** Jour. Heredity **9**: 211–226. May–June, 1918. (See Bot. Absts. 1, Entry 221.)] Zeitschr. Pflanzenzücht. **7**: 324. Nov., 1920.

1689. Anonymous. [German rev. of: Hagedoorn-La Brand, A. C., and A. L. Hagedoorn. **Parthenogenesis in higher plants.** Teysmannia **27**: 643–656. *1 pl.* 1917. (See Bot. Absts. 1, Entry 1793.)] Zeitschr. Pflanzenzücht. **7**: 325. Nov., 1920.

1690. Anonymous. [German rev. of: Hayes, H. K. **Natural crossing in wheat.** Jour. Heredity **9**: 326–330, 334. *Fig. 14–15.* Nov., 1918. (See Bot. Absts. 1, Entry 1503.)] Zeitschr. Pflanzenzücht. **7**: 325–326. Nov., 1920.

1691. Anonymous. [German rev. of: Heribert-Nilsson, N. **Zuwachsgeschwindigkeit der Pollenschläuche und gestörte Mendelzahlen bei Oenothera Lamarckiana. (Decline in pollen-tube growth and deranged Mendelian ratios in Oenothera Lamarckiana.)** Hereditas **1**: 41–67. *1 fig.* 1920. (See Bot. Absts. 6, Entry 1689.)] Zeitschr. Pflanzenzücht. **7**: 327. Nov., 1920.

1692. Anonymous. [German rev. of: Heusser, C. **Over de selektie van Hevea Brasiliensis Müll. (On selection in Hevea brasiliensis.)** Arch. Rubbercult. Nederlandsch-Indië **3**: 1919.] Zeitschr. Pflanzenzücht. **7**: 326. Nov., 1920.

1693. Anonymous. [German rev. of: Honing, J. A. **A sterile dwarf form of Deli tobacco originated as a hybrid.** Bull. Deli Proefsta. Medan **10**: 24. *4 pl.* 1917.] Zeitschr. Pflanzenzücht. **7**: 326. Nov., 1920.

1694. Anonymous. [German rev. of: Johnson, James. **An improved strain of Wisconsin tobacco.** Jour. Heredity **10**: 281–288. *Fig. 8–10.* June, 1919. (See Bot. Absts. 7, Entry 1776.)] Zeitschr. Pflanzenzücht. **7**: 327. Nov., 1920.

1695. Anonymous. [German rev. of: Jones, D. F. **Selection in self-fertilized lines as the basis for corn improvement.** Jour. Amer. Soc. Agron. **12**: 77–100. 1920. (See Bot. Absts. 5, Entry 1543.)] Zeitschr. Pflanzenzücht. **7**: 328. Nov., 1920.

1696. Anonymous. [German rev. of: Kempton, J. H. **Heritable characters of maize. III. Brachytic culms.** Jour. Heredity **11**: 111–115. *4 fig.* Mar., 1920. (See Bot. Absts. 7, Entry 1787.)] Zeitschr. Pflanzenzücht. **7**: 328. Nov., 1920.

1697. Anonymous. [German rev. of: Koch, L. **De beteekenis van de bastaardselectie bij padi en how deze wordt uitgevoerd. (The significance of hybrid selection in rice and how it is conducted.)** Teysmannia **1916**: 502–519. 1916.] Zeitschr. Pflanzenzücht. **7**: 329. Nov., 1920.

1698. Anonymous. [German rev. of: Koch, L. **Onderzoekingen betreffende de praktijkwaarde van de lijenselectie methode voor verschillende eenjarige landbouwgewassen.** (Investigations concerning the practical value of the line selection method for different annual agricultural plants.) Teysmannia 29: 1–36, 96–127, 156–191, 389–423. 1918. (See Bot. Absts. 5, Entry 1551.)] Zeitschr. Pflanzenzücht. 7: 329–331. Nov., 1920.

1699. Anonymous. [German rev. of: Koch, L. **Uitkomsten van eenige selectieproeven met padi.** (Results with some selection experiments with rice.) Korte Ber. Selectie- en Zaadtuin Dept. Landb. Nijv. en Handel [Buitenzorg] 21. *16 p.* July, 1919. (See Bot. Absts. 6, Entry 688.)] Zeitschr. Pflanzenzücht. 7: 331. Nov., 1920.

1700. Anonymous. [German rev. of: Koch. L. **Uitkomsten van onderzoekingen over enkele kenmerken en eigenschappen van het padigewas.** (Results of an investigation of some characteristics of the rice plant.) Korte Ber. Selectie- en Zaadtuinen Dept. Landb. Nijv. en Handel [Buitenzorg] 7. *4 p.* Nov., 1917.] Zeitschr. Pflanzenzücht. 7: 332. Nov., 1920.

1701. Anonymous. [German rev. of: Koch, L. **Uitkomsten van eenige selectieproeven met padi.** (Results of selection experiments with rice.) Korte Ber. Landbouwvoorlichtingsdienst Dept. Landb. Nijv. en Handel [Buitenzorg] No. 1, 1916. No. 5, Nov., 1917. No. 6, Nov., 1917. No. 8, Aug., 1918.] Zeitschr. Pflanzenzücht. 7: 332. Nov., 1918.

1702. Anonymous. [German rev. of: Kotowski, Feliks. **Zmiennósé i Korrelacye w "czystej linii" pszenicy. Tr. vulgare Ostka biala dublańska.** (Correlation and variability in a pure line of wheat.) Polnisch: Tygodnika Rolnivzy, Krakau, 1919.] Zeitschr. Pflanzenzücht. 7: 333–334. Nov., 1920.

1703. Anonymous. [German rev. of: Leighty, Clyde E. **Natural wheat-rye hybrids of 1918.** Jour. Heredity 11: 129–136. *4 fig.* Mar., 1920. (See Bot. Absts. 7, Entry 1797.)] Zeitschr. Pflanzenzücht. 7: 334. Nov., 1920.

1704. Anonymous. [German rev. of: Leverenz, C. **Die meistgebauten landwirtschaftlichen Pflanzenzüchten Deutschlands mit Ausnahme der Kartoffeln.** (The principal agricultural plant breeds of Germany, with exception of potatoes.) Landwirtschaftskammer f. d. Provinz Sachsen. *79 p.* Hermann Kuhnt: Halle, 1920.] Zeitschr. Pflanzenzücht. 7: 342–343. Nov., 1920.

1705. Anonymous. **Begonia breeding.** [Rev. of: Moore, H. J. **Mendel's law in the genus Begonia.** Canadian Florist 15: 327–328. Nov. 25, 1920.] Florists' Exchange 50: 967. Nov. 6, 1920.

1706. Anonymous. [German rev. of: Nafziger, T. E. **How sorghum crosses are made.** Jour. Heredity 9: 321–322. Nov., 1918. (See Bot. Absts. 2, Entry 39.)] Zeitschr. Pflanzenzücht. 7: 336. Nov., 1920.

1707. Anonymous. [German rev. of: Nilsson-Ehle, H. **Über Resistenz gegen Heterodera Schachti bei gewissen Gerstensorten, ihre Vererbungsweise und Bedeutung für die Praxis.** (On resistance to Heterodera Schachti in certain varieties of barley, its method of inheritance and significance for agricultural practise.) Hereditas 1: 1–34. *4 fig.* 1920. (See Bot. Absts. 6, Entry 1731.)] Zeitschr. Pflanzenzücht. 7: 336. Nov., 1920.

1708. Anonymous. [German rev. of: Rasmusson, J. **Mendelnde Chlorophyll-faktoren bei Allium cepa.** (Mendelian chlorophyll factors in Allium cepa.) Hereditas 1: 128–134. 1920. (See Bot. Absts. 6, Entry 1739.)] Zeitschr. Pflanzenzücht. 7: 337. Nov., 1920.

1709. Anonymous. [Rev. of: Salmon, E. S. **On forms of the hop (Humulus lupulus L., and H. americanus, Nutt.) resistant to mildew (Sphaerotheca humuli D. C. Burr.) IV. Ann.** Applied Biol. 6: 293–310. 1920. (See Bot. Absts. 7, Entry 933.)] Gard. Chron. 68: 259. Nov. 27, 1920.

1710. Anonymous. [German rev. of: Tedin, Hans. **The inheritance of flower colour in Pisum.** Hereditas 1: 68–97. *1 colored pl., 2 fig.* 1920. (See Bot. Absts. 6, Entry 1776.)] Zeitschr. Pflanzenzücht. 7: 337–338. Nov., 1920.

1711. Anonymous. [German rev. of: Tischler, G. **Ueber die sogenannten "Erbsubstanzen" und ihre Lokalisation in der Pflanzenzelle.** (**On the so-called hereditary substances and their localization in the plant cell.**) Biol. Zentralbl. 40: 15–28. 1920. (See Bot. Absts. 7, Entry 939.)] Zeitschr. Pflanzenzücht. 7: 338. Nov., 1920.

1712. Anonymous. [German rev. of: Tjebbes, K., en H. N. Kooiman. **Erfelijkheidsonderzoekingen by boonen. III. Albinisme.** (**Hybridization experiments with beans. III. Albinism.**) Genetica 1: 532–538. *1 pl., 3 fig.* Nov., 1919. (See Bot. Absts. 6, Entry 1135.)] Zeitschr. Pflanzenzücht. 7: 338. Nov., 1920.

1713. Anonymous. [German rev. of: von Ubisch, G. **Anwendung der Vererbungsgesetze auf die Kulturpflanzen.** (**Application of the laws of heredity to cultivated plants.**) Naturwissenschaften 8: 293–300. 1920.] Zeitschr. Pflanzenzücht. 7: 339. Nov., 1920.

1714. Anonymous. [German rev. of: Urban, J. **Die Grösse der Rübenknäuel und der Rübenertrag.** (**Size of the beet seed-balls and the yield of beets.**) Zeitschr. Zuckerind. Cechoslovak. 44: 151–155. 1920.] Zeitschr. Pflanenzücht. 7: 339. Nov., 1920.

1715. Anonymous. [German rev. of: White, O. E. **Inheritance studies in Pisum. IV. Interrelation of the genetic factors of Pisum.** Jour. Agric. Res. 11: 167–190. 1917. (See Bot. Absts. 1, Entry 1315.)] Zeitschr. Pflanzenzücht. 7: 340. Nov., 1920.

1716. Anonymous. [German rev. of: White, O. E. **The present state of knowledge of heredity and variation in peas.** Proc. Amer. Phil. Soc. 56: 487–588. 1917.] Zeitschr. Pflanzenzücht. 7: 339. Nov., 1920.

1717. Anonymous. [German rev. of: Zaleski, Leopold. **Wkwestyi metod analityernych w selekcjii buraków pastewnych.** (**Contribution to the analytical method in fodder-beet breeding.**) Ziemianin Posen, 1920.] Zeitschr. Pflanzenzücht. 7: 340. Nov., 1920.

1718. Anonymous. [German rev. of: Zinn, Jacob. **On variation in Tartary buckwheat, Fagopyrum tartaricum (L) Gaertn.** Genetics 4: 534–586. *11 fig.* Nov., 1919.] Zeitschr. Pflanzenzücht. 7: 340. Nov., 1920.

1719. Babcock, Ernest B., and Julius L. Collins. **Interspecific hybrids in Crepis. I. Crepis capillaris (L) Walh. × Crepis tectorum L.** Univ. California Publ. Agric. Sci. 2: 191–204. *Pl. 36–38.* 1920.—Reciprocal crosses were made between *Crepis capillaris* which has three pairs of chromosomes and *C. tectorum* which has four pairs. The F_1's showed dominance of the *tectorum* cotyledon characters as well as hybrid vigor, but did not survive beyond the cotyledon stage. Cells of the root tips of the F_1 seedlings contained seven chromosomes, the sum of the haploid numbers of the two species. Examination of a young F_1 seedling which had reached the limit of development revealed an unusual teratological cell condition. This interruption of the functioning systems, which causes the premature death of the plant, is regarded as evidence against the hypothesis that *C. tectorum* originated by non-disjunction of one pair of the *capillaris* chromosomes.—*C. B. Hutchison.*

1720. Bannier, J. P. [Dutch rev. of: Correns, C. **Die geschlechtliche Tendenz der Keimzellen gemischtgeschlechtiger Pflanzen.** (**Sex tendency of germ-cells in plants of mixed sex.**) Zeitschr. Bot. 12: 49–60. *2 fig.* 1920.] Genetica 2: 451–452. Sept., 1920.

1721. Bannier, J. P. [Dutch rev. of: Coulter, Merle C. **Inheritance of aleurone color in maize.** Bot. Gaz. 69: 407–425. May, 1920. (See Bot. Absts. 5, Entry 1477.)] Genetica 2: 452–453. Sept., 1920.

1722. Bannier, J. P. [Dutch rev. of: Stout, A. B. **Intersexes in Plantago lanceolata.** Bot. Gaz. 68: 109–133. 1919. (See Bot. Absts. 3, Entry 1517.)] Genetica 2: 476–477. Sept., 1920.

1723. Baumann, E. **Beiträge zu der Individual- und Immunitätszüchtung bei der Kartoffel. [Contributions on the question of individual and immunity breeding of the potato.]** Jour. Landw. 68: 145–206. *1 fig.* 1920.—These investigations on two commercial varieties of potatoes show the practical possibility of increasing production of the crop by means of pure-line selection, securing in this way strains that are resistant or practically immune to several diseases. Data are given on these points: plant yield; starch content and starch yield, with correlation of these; number, size and starch content of tubers; correlation of number and size of tubers with tuber yield and starch yield; influence of weather conditions and disease on yield; food qualities and cooking values.—*C. E. Leighty.*

1724. Becker, J. **Xenien zwischen Melonen und Gurken. [Xenia between muskmelons and cucumbers.]** Zeitschr. Pflanzenzücht. 7: 362–364. Nov., 1920.

1725. Benders. [Dutch rev. of: Doyer, J. J. Th. **Proeve van een onderzoek omtrent het familiair en hereditair voorkomen van tuberculose volgens de wetenschappelijkgenealogische methode. (Preliminary researches about the familial and hereditary occurrence of tuberculosis following scientific genealogical methods.)** *214 p., 7 genealogical trees, and 258 quarter tables.* Diss. J. B. Wolters U. M.: Groningen, 1920. (See Bot. Absts. 6, Entry 1074.)] Genetica 2: 453–459. Sept., 1920.

1726. Benders. [Dutch rev. of: Slye, Maud. **The relation of inbreeding to tumor production: studies in the incidence and inheritability of spontaneous tumors in mice.** Jour. Cancer Res. Jan., 1920.] Genetica 2: 475. Sept., 1920.

1727. Blakeslee, A. F. **A dwarf mutation in Portulaca showing vegetative reversions.** Genetics 5: 419–433. *1 fig.* July, 1920.—One compact dwarf plant, found in a sowing of *Portulaca grandiflora*, was crossed with varieties of the normal form. The normal appeared completely dominant. The dwarfs showed no red in the stems (except in the seedling stage) while the corresponding normals did. Dwarfs selfed gave 2653 dwarf to 14 normal. With this exception, normal and dwarf were proved to act as a simple Mendelian pair, assuming that the dwarfs are less viable. Ten of the selfed dwarfs produced 1294 dwarfs, which were specially examined, and 16 bore some normal branches with long internodes and red stems. These branches were shown to be heterozygous; while the other branches of the plants which bore them proved to be homozygous dwarf. Since these ten parents also bore 7 normals, there was a total mutation from recessive to dominant of 1.8 per cent. Mutations, like the original, from dominant to recessive, could not be visible in homozygous normals, and might readily be overlooked in heterozygotes.—*John Belling.*

1728. Bonnier, Gaston. **Sur les changements, obtenus expèrimentalement, dans les formes végétales. [On the alterations experimentally obtained in the form of plants.]** Compt. Rend. Acad. Sci. Paris 170: 1356–1359. 1920.

1729. Broili. **Solanum edinense Berthault, ein für die Landwirtschaft wertvoller Kartoffelbastard. [Solanum edinense Berthault, a potato hybrid valuable for agriculture.]** Deutsch. Landw. Presse 1920: 359–361. 1920.

1730. Brožek, Arthur. **Mosaikbastard. Mimulus tigrinoides Hort., hybrida var. Paulina (var. nova). [A mosaic hybrid. Mimulus tigrinoides Hort. hybrida var. Paulina (var. nova).]** Lékařske Rozhledy 7: 8–12, 221–232. 1920.

1731. Brüel, L. [German rev. of: Roux, W. **Über die bei der Vererbung von Variationen anzunehmenden Vorgänge, nebst, einer Einschaltung über die Hauptarten des Entwicklungsgeschehens. (On the putative processes in the inheritance of variations and an interpolation on the chief kinds of developmental phenomena.)** Vortr. Aufsätze u. Entwicklungsmech. Org. *68 p.*, 1913.] Zeitschr. Indukt. Abstamm. u. Vererb. 24: 291–292. Nov., 1920.

1732. Bryn, Halfdan. **Researches into anthropological heredity.** Hereditas 1: 186–212. 1920.—The studies have been conducted in "two much isolated mountain districts" of Norway. The paper is in two parts, the first "On the inheritance of eye colour in man." The eyes of 834 individuals were examined through a magnifying glass and two types of eye color distinguished: (1) eyes with "a single layer of black pigment in the back part of iris, appearing always blue or gray;" (2) eyes "which besides this pigment also contains a more or less brownish one, which eyes appear brown, green, gray, bluish-brown or blue if the brownish pigment is to be found very scantily." Under the latter type is segregated also a group of "mixed" eyes, which appears to yield at least one biotype. Individuals homozygous for "brown" eyes are "probably very rare in the population," hence the mode of inheritance was not especially studied. In general it was found that "in our population there are probably three biological types with regard to eye-colour; (a) the plain blue type; (b) the plain brown type; (c) the light 'mixed' type. These different types interbreed in accord with the Mendelian laws of heredity, viz., blue eyes are recessive to all types of eyes with brownish pigment."—The second part of the paper treats of "The genetic relation of index cephalicus." The two districts mentioned "differ very much with regard to the size of this index;" one "characterized as rather brachycephalic," having an index of 80.1, the other an index of 76.9, while "the average index of the entire country is about 78.0." A careful study of the collected data shows "very plainly that there are at least two types in each of the districts. One is common to both districts. It is the northern fair nucleus," with an index of about 77.5. In one district this is associated with "a dark brachycephalic type," index about 83, and in the other district it is associated with a "dark dolichocephalic type," index about 73. The author concludes that there are here "three biotypes . . . . with regard to index cephalicus" which interbreed in Mendelian fashion. "The brachycephalic type is dominant to both the others. The dolichocephalic type is too rare to allow any positive conclusions; it seems, however, to be dominant to the mesocephalic type and recessive to the brachycephalic type."—*Howard J. Banker.*

1733. Burch, D. S. **Heredity and economical production of food.** Jour. Heredity 11: 7–11. *2 fig.* 1920.—Pointing out the lack of thought and knowledge of the principles of breeding and a discussion of the work of the Federal Department of Agriculture to encourage the application of these principles to livestock and farm crops.—*J. H. Beaumont.*

1734. Castle, W. E. **Genetics and eugenics.** *2nd ed., 15.5 × 23.5 cm., 395 p., 7 pl., 155 fig.* Harvard Univ. Press: Cambridge, Massachusetts, 1920.—Second edition shows extensive revision with addition of much new matter mainly represented by interpolated chapters on "Genetic changes and the chromosomes," "Genetic changes in asexual reproduction, in parthenogenesis, and in self-fertilization," "Genetic changes in bisexual reproduction," and "Hybrid vigor and heterosis." The author's hooded-rat results are shown to be due to the action of modifying factors, on an unchanged fundamental gene for the hooded character; and blending inheritance, and Johannsen's pure-line principle are also given new treatment which brings the author's position on these subjects into better accord with that generally held by other geneticists. The extensive bibliography which was an excellent feature of the first edition has been brought down nearly to date of publication of the second edition, by the addition of more than 200 titles.—*Geo. H. Shull.*

1735. Chamberlain, Charles J. **Grouping and mutation in Botrychium.** Bot. Gaz. 70: 387–398. *11 fig.* Nov., 1920.—*B. dissectum* never occurs except in association with *B. obliquum.* In *B. dissectum* many sporangia are abortive, and many spores of apparently perfect sporangia are obviously abortive, suggesting at least partial, and probably entire, sterility. *Botrychium* does not reproduce vegetatively; hence *B. dissectum* must arise from mutating spores (2–5 per cent) of *B. obliquum.* Direct cultural proof is impossible, since *Botrychium* spores cannot be germinated artificially.—*Merle C. Coulter.*

1736. Cole, Leon J. **An early family history of color-blindness.** Jour. Heredity 10: 372–374. *Fig. 12.* Nov., 1919.—The Philosophical Transactions of the Royal Society of

London for 1779 contain a rather complete family history of color-blindness, of interest because of its early date and because the facts as given fall in line with the interpretation of color-blindness as a sex-linked character in man.—*J. H. Beaumont.*

1737. Collins, G. N., and J. H. Kempton. **Heritable characters of maize. I. Lineate leaves.** Jour. Heredity **11**: 3–6. *Frontispiece.* Jan., 1920.—The authors point out the desirability of reporting characters of genetic value as they appear in such an economic crop as maize in order to avoid needless duplication by the workers in the field. They discuss the character "lineate" and show that it may take its place among the other chlorophyll variations of maize. [See also Bot. Absts. 7, Entry 1680.]—*J. H. Beaumont.*

1738. van Creveld, S. [Dutch rev. of: Harris, J. Arthur, and Francis G. Benedict. **A biometric study of basal metabolism in man.** Carnegie Inst. Washington Publ. 279. *v + 266 p., 28 diagrams.* Washington, D. C., 1919.] Genetica **2**: 466–468. Sept., 1920.

1739. Danforth, C. H. **Resemblance and difference in twins.** Jour. Heredity **10**: 399–409. *Fig. 9–14.* Dec., 1919.—A discussion of the answers to questionnaires received by the American Genetic Association from a number of twins. The answers to questions of the general headings: height, weight, hair and eye color, physical traits, physiological traits, mental traits and stronger affection, indicate that in uniovular twins identical likenesses are the rule, while in biovular twins differences of the same order as between children of different ages may be expected though striking similarities do occur in biovular twins of the same sex. The author discusses the extent of similarity in biovular twins and the reason for expecting differences in uniovular twins.—*J. H. Beaumont.*

1740. Daniel, Lucien. **Recherches sur la greffe des Solanum. [Studies on the graft of Solanum.]** Compt. Rend. Acad. Sci. Paris **171**: 1074–1076. Nov. 29, 1920.

1741. Davenport, Charles B. **Heredity of constitutional mental disorders.** Psychol. Bull. **7**: 300–310. Sept., 1920.—The author reports chiefly his own investigations, but also cites the most significant findings of recent study by others.—Analyses of the pedigrees of feeble-minded individuals yield results supporting the conclusion that there is a single Mendelian factor absent in the ordinary type of feeble-mindedness. If the germ defect results in the insufficient production of some hormone upon which the higher functions depend, the intellectual centers develop each with its own idiosyncrasies and cease development prematurely at a low level. In the most extensive pedigrees the defect has been traced for nine or more generations and it is suspected that if records were obtainable it would go back 2000 years or more.—Contrary to former assertion on the non-inheritance of Mongolian imbecility, recent investigations reveal neurotic conditions in both lines of ancestry.—Amaurotic idiocy is apparently confined to families of Russian Jews.—It is not yet possible to say that every case of epilepsy is inherited, but it is certain that in a majority of instances there is nervous defect on both sides of the family. The element of periodicity in epilepsy has a clear inheritable basis and the tendency to fugues is evidently a sex-linked trait, i.e., a nomadic male inherits it from his mother's close male relatives.—The method of inheritance of dementia praecox has been investigated by several authors all of whom conclude that it is a simple Mendelian recessive. On the other hand Huntington's chorea and the temperamental tendency to more or less periodic outbursts of violence seems to be a Mendelian dominant. In the manic-depressive group of psychoses the hyperkinetic tendency is inherited independently of the hypokinetic. The author formulates the hypothesis that the presence or absence of genetic factors determines an individual's reactability to exciting situations. The history of changes of mood in identical twins strikingly corroborates the view.—The question of inheritance of criminality receives the author's negative judgment except in so far as the etiology is found in the inheritable traits of feeble-mindedness, feeble inhibition, or defective internal secretions.—The bearing of consanguinity upon mental disorders is confined to matings in which both parents carry some recessive defect.—*Miriam C. Gould.*

1742. Davenport, C. B. **Annual report of the Director of the Department of Experimental Evolution and of the Eugenics Record Office.** Carnegie Inst. Washington Year Book 19. (1920): 107–157. 1921.—Surveying the past, author points out part played by his Staff in helping to establish relation of chromosomes to genetical facts and as to future plans he emphasizes the eugenical, and the desirability of much mammalian experimentation as likely to bear strongest on human genetics. Metz reports on gametogenesis in *Asilus* and *Drosophila* and finds indications in latter of process differing in male and female. A set of 3 allelomorphic mutations of the eye in *D. virilis* is mentioned, of which 2 are accompanied by more or less sterility. MacDowell has completed a report showing that alcoholic grandparents diminish learning and retention ability of rats. Alcoholic parents showed similar but less marked influence on children, although latter were one generation nearer to the alcohol. Riddle studied metabolism of male and female embryos in doves and pigeons. Relatively more female than male embryos withstood diminished oxygen pressure, indicating lower metabolism in females. Age of embryo is important factor in survival. Little demonstrated presence of sex-linked lethal factors in mice causing ratio of sexes of about 1 male to 2 females. Statistical analysis of human pedigrees of hemophilia and color-blindness revealed that considerably more than half of the males showed hemophilia or color-blindness and the condition is thought to be due to lethal factors linked with normal allelomorphs of the abnormal genes in sex chromosome. Proof of harmful action of weak acids on sperm was also obtained. The previously known condition of heritability of cancer in mice was made much more definite by Little whose F_2 numbers point to 4 independent autosomal genes determining susceptibility, all of which must be simultaneously present. Occurrence of spotted mutants in non-spotted dog breeds is also recorded by Little. Banta reported that selection for sex-intergradedness in Daphnids was successful. A report on selection for reactiveness to light was completed. Banta was also interested in supposed mutative color changes in flounders, 20 per cent of the new year's crop being pigmented on the lower side. Blakeslee continued studies on mutation and sexuality in Mucors. In *Portulaca* a dominant vegetative mutation affecting flower color appeared in a part of a white plant. Some cases like that of a purple flower breeding white are deemed to have been periclinal chimeras. In *Datura*, work on the graft-infectious disease "Quercina" has been completed. The mutant "New Species" was found to be tetraploid, i.e., with 24 chromosomes. "Globe" type of mutant seems to be due to 25 chromosomes. Harris with others has reported on vascular anatomy of variant bean seedlings; on the physiology of egg production; on properties of vegetable saps and on theory of plot tests. Banker's study of heredity in a human pedigree of better sort revealed large number of college men. Some lines showed higher percentage than others. Davenport studying twin births found that twinning is due to both father and mother. He completed anthropological studies of American population based on army data. Laughlin has completed a work on eugenical sterilization in the United States and collected data on state institutions for defectives.—*James P. Kelly.*

1743. Dorsey, M. J. **A note on the dropping of flowers in the potato.** Jour. Heredity **10**: 226–228. *Fig. 19.* 1919.—On most of the common varieties of potatoes many of the flowers abscise either before the flower opens or before fertilization can take place. In some cases the partially developed seed ball will abscise. Since pollen abortion is very common and occurs in varying percentages, though the flowers develop perfect pistils, and since abscission occurs before tuber formation or the stimulus due to fertilization, it is evident that some other physiological process is active.—*J. H. Beaumont.*

1744. Ellinger, Tage. **On the numerical expression of the degree of inbreeding and relationship in a pedigree.** Amer. Nat. **54**: 540–545. *1 fig.* Nov.–Dec., 1920.—The paper gives a modification and some extensions to the system of measuring degrees of inbreeding and relationship published by Dr. Raymond Pearl in several articles in the American Naturalist, 1913–1917.—It is attempted first to bring all measurements on the same scale and for that purpose it has been necessary slightly to change the definition of the Coefficient of Relationship, and further to express both the Total Inbreeding Coefficient and the new Total

Relationship Coefficient in areas, using the actual percentage of the maximum area as measure. The new Total Relationship-Inbreeding-Index finally measures—also in areas—the proportion of the total inbreeding in the pedigree of an individual that is due to the relationship between its parents. The full system of measurements is used as an example on the pedigree of the Jersey bull King Melia Rioter 14th.—*Tage Ellinger.*

1745. Emerson, R. A. **Heritable characters of maize. II. Pistillate-flowered maize plants.** Jour. Heredity **11**: 65–76. *8 fig.* Feb., 1920.—Description and genetic behavior of two types of terminal inflorescence of maize to which the names "tassel seed" and "tassel ear" have been given. The two types are genetically distinct but further work must be done to determine the exact factoral and linkage relationships. [See also Bot. Absts. 7, Entry 1684.]—*J. H. Beaumont.*

1746. Ernst, A. **Über Parthenogenesis und Apogamie. [On parthenogenesis and apogamy.]** Verhandl. Schweiz. Naturf. Ges. **1919**: 1–20. 1919.—See Bot. Absts. 7, Entry 1685.

1747. Fairchild, David. **Twins. Their importance as furnishing evidence of the limitations of environment.** Jour. Heredity **10**: 387–396. *Frontispiece, fig. 1–7.* 1919.—A brief philosophical discussion of the value of studies of individuals having identical germ-plasm to determine the importance and limitations of environment as affecting heredity. The author mentions certain of the factors of environment which do not affect heredity but indicates the significance of the work undertaken by the American Genetics Association in the study of photographs and answers to questionnaires submitted by 600 twins.—*J. H. Beaumont.*

1748. Feenstra-Sluiter, C. **Waarnemingen en Beschouwingen over Bloei Bevruchting en Zaadvorming bij Cinchona Ledgeriana Moens. [Observations and considerations of flowering, fertilization and seed formation in Cinchona Ledgeriana Moens.]** Mededeel. Kina-Proefsta. **6**. *35 p, 20 fig.* 1919.—See Bot. Absts. 7, Entry 1686.

1749. Firbas, Heinrich. **Über die Erzeugung von Weizen-Roggenbastardierungen. [The production of wheat-rye hybrids.]** Zeitschr. Pflanzenzücht. **7**: 249–282. Nov., 1920.

1750. Fischer, H. **Kohlensäure und Pflanzenzüchtung. [Carbon dioxid and plant breeding.]** Zeitschr. Pflanzenzücht. **7**: 364–366. Nov., 1920.

1751. Fischer, H. **Orthogenesis, Mutation, Auslese. [Orthogenesis, mutation, selection.]** Naturw. Wochenschr. **19**: 561–566. 1920.

1752. Fleischer, B. **Über myotonische Dystrophie mit Katarakt. [On myotonic dystrophy with cataract.]** Arch. Ophthalmol. **96**: 1–43. 1918.—See Bot. Absts. 7, Entry 1803.]

1753. Fleischer, Bruno, und William Josenhans. **Ein Beitrag zur Frage der Vererbung der familiären Sehnervenatrophie (Leberscher Krankheit). [Contribution to the question of the inheritance of familial atrophy of the optic nerve (Leber's disease).]** Arch. Rass. Gesellschaftsbiol. **13**: 129–158. *5 pl.* 1920.

1754. Francé, R. H. **Der Parasitismus als schöpferisches Prinzip. [Parasitism as a creative principle.]** Centralbl. Bakt. **59**: 54–64. *6 fig.* 1920.—See Bot. Absts. 7, Entry 1799.

1755. Frimmel, Fr. **Über einem Versuch der Züchtung schwarzer Farbentöne an der Gartenprimel. (On an attempt to breed black color-tone in the garden Primula.)** Zeitschr. Pflanzenzücht. **7**: 346–356. Nov., 1920.

1756. Gates, R. R. **Mutational v. recapitulatory characters.** Rept. British Assoc. Adv. Sci. Bournemouth Meeting **1919**: 340. 1920.—Characters are divided into two classes: Mutations which owe their origin to a nuclear change and modify every stage of the ontogeny, and recapitulatory characters which arise through the impress of environment and usually involve adaptation to new conditions.

These two classes of characters differ in (a) their manner of origin, (b) their relation to organic structure, and (c) their relation to phenomena such as recapitulation, adaptation, distribution, and inheritance. It is held that characters which show recapitulation could not have arisen through mutation, for that would modify every stage instead of adding certain stages as it does. The unsuccessful attempts of many zoologists to explain away the remarkable facts of recapitulation is noted. The apparent contradictions of von Baer's law of animal development is held to be due partly to the occurrence of mutations in organisms which already show recapitulation.—The author concludes that both types of characters are necessary to account for the phenomena of evolution. The recognition of both types involves the limitation of the cell theory and the admission of the neo-Lamarckian factor.—*J. H. Kempton.*

1757. G[ates], R. R. **Orthogenetic evolution in pigeons.** [Rev. of: Whitman, Charles Otis. **Posthumous works.** Edited by Oscar Riddle (vol. 3 edited by H. A. Carr). Carnegie Inst. Washington Publ. 257. *x + 194 p., 88 pl., 36 fig.; 224 p., 39 pl., 11 fig.; xi + 161 p.* 1919.] Nature **104**: 566–568. 1920.

1758. Goodale, H. D. **Concerning the summer plumage of the drake.** (Abstract.) Anat. Rec. **14**: 92–93. 1918.—Some ducks, such as the Gray Call, Mallard, and Rouen, molt early in the summer (June). The new plumage, called summer plumage, is entirely unlike the old, since it strongly resembles that of the female. If the testes of the male are completely removed, the change in color no longer occurs, although the birds molt. Further studies of the problem show that, potentially, the change in color of the intact male takes place 2 or 3 months prior to the actual change, for the potential change, at will, may be rendered actual by removing feathers and thus inducing a growth of new ones. The new feathers that come in late in the winter are like the old, but those pulled a little later (March) are like the summer plumage. This change coincides approximately with the beginning of manifestations of sexual activity.—It has also been found that about the time the summer plumage reaches its height, sexual activity diminishes or disappears. At this time the reproductive system of the male contains few or no spermatozoa. The summer plumage no sooner reaches its height than the change back to the breeding plumage begins.—It is apparent, therefore, that the summer plumage develops coincidently with the period of greatest activity of the testes, while the breeding plumage, so-called, develops during the quiescent period.—The histological changes in the testes are being examined.—*H. D. Goodale.*

1759. Gowen, John W. **Conformation and its relation to milk-producing capacity in Jersey cattle.** Jour. Dairy Sci. **3**: 1–32. *1 fig.* Jan., 1920.—A biometric analysis of the relation between conformation and milk production in 1674 Jersey cows entered in the Registry of Merit. The data on conformation are the detailed and total scores of about 140 judges, collected by the Secretary of the Jersey Cattle Club. The average total score of these cows was 89.8 where 100 represents the ideal type. Among the elements of conformation, those pertaining to the mammary system showed most room for improvement. This same group of characteristics was also the most variable. The correlation between total score and milk yield for a year was $+ 0.194 \pm 0.016$. Aside from total score the best indications of high yield were found to be large, tortuous, and elastic milk veins (+0.191); udder large and not fleshy (+0.191); rear udder well rounded out and well out and up behind (+0.171); body, wedge shape, with deep large paunch, legs proportionate to size and fine quality (+0.166); and general appearance (+0.115). Ten other elements in the score dealing with conformation of thighs, rump, fore udder, teats, head, tail, general shape of udder, size, hip bones and neck showed correlations with milk yield ranging from +0.089 to +0.050 which were probably significant. There were positive but insignificant correlations in the case of eyes, horns and muzzle and lung capacity as indicated by depth and breadth through body just back of fore legs. The only negative correlation was in the case of straight back (-0.070 ± 0.017). It is pointed out that other data show correlations between a seven day test and year milk yield $2\frac{1}{2}$ times as great as that between total score and year milk yield, proving that even a short test of actual production is much superior to any judgment based on conformation.—*Sewall Wright.*

1760. Haecker, V. **Über weitere Zusammenhänge auf dem Gebiete der Mendelforschung. [On further correlations in the field of Mendelian investigation.]** Pflüger's Arch. Gesamte Physiol. **181**: 149–169. 1920.

1761. Hansen, W. **Die Mahndorfer Pflanzenzüchtung bzw. das Mahndorfer Usancenbuch. [The Mahndorf plant-breeding or the book of Mahndorf methods.]** Zeitschr. Pflanzenzücht. **7**: 283–318. *5 fig.* Nov., 1920.

1762. Harland, S. C. **Inheritance in Dolichos lablab, L. Part I.** Jour. Genetics **10**: 219–226. Oct., 1920.—Two white-flowered varieties of the bonavist were crossed. The anthers open before the flowers, and bagging was therefore omitted. The character of indefinite growth was proved a Mendelian dominant to the bush habit. One variety had no visible anthocyan; the other had purple in the seed-coat and hairs of the stipules. F_1 had purple flowers, nodes, and leaf-ribs, with black seeds. In F_2 the ratio by flower-color was 9:7, as was confirmed in subsequent generations. By seed-color, the ratio in F_2 was 9:3:4.—*John Belling.*

1763. Harman, Mary T. **Chromosome studies in Tettigidae. II. Chromosomes of Paratettix BB and CC and their hybrid BC.** Biol. Bull. **38**: 213–230. *3 pl.* April, 1920.—Cytological observations on spermatogenesis in grouse locusts used by R. K. Nabours in genetical work. Chromosomes of form BB are like those of CC except that one pair ("the third pair") is hook-shaped instead of straight. Hybrid BC has one hooked and one straight chromosome in third pair. Author describes end-to-end union of chromosomes with "not . . . . the least appearance of a side-by-side pairing" in growth period. Believes lack of crossing over in *Paratettix* is explained by absence of parasynapsis. Suggests that in *Apotettix* where crossing over occurs parasynapsis may occur.—*C. W. Metz.*

1764. Hart, C. **Über die Vererbung erworbener Eigenschaften. [On the inheritance of acquired characters.]** Berlin. Klin. Wochenschr. **57**: 654–656. 1920.

1765. Hayes, H. K., and Harry V. Harlan. **The inheritance of the length of internode in the rachis of the barley spike.** U. S. Dept. Agric. Bull. 869. *26 p., 2 pl., 2 fig.* Sept. 30, 1920.—Extensive data bearing on the inheritance of length of rachis internode in crosses between pure lines of barley is given. Four dense and six lax or semi-lax sorts were used. In F_1 density is dominant or semi-dominant. In F_2 the range of variability includes the modal class of both parents. In F_3 homozygous strains were isolated similar to either parent. In three crosses types homozygous for intermediate densities were also obtained. The author interprets his results on the factor basis, assuming one, two, or more factors as the specific cases warrant. The significance of the constancy of internode length as an aid to barley classification is noted.—*F. P. Bussell.*

1766. Hayes, H. K., John H. Parker, and Carl Kurtzweil. **Genetics of rust resistance in crosses of varieties of Triticum vulgare with varieties of T. durum and T. dicoccum.** Jour. Agric. Res. **19**: 532–542. *6 pl.* Sept., 1920.—Inheritance studies are reported on rust resistance as correlated with certain botanical and morphological characters in crosses between common wheats and resistant pure-line strains of durum and emmer. Earlier work presented difficulties of interpretation due to the presence of different biologic strains of rust. Parent strains of wheat together with F_2 and F_3 generation material were inoculated with a pure strain of *Puccinia graminis tritici.* The durum × common cross gave susceptible F_1, while emmer × common showed resistance partially dominant, therefore, reciprocal crosses behaved similarly. There was some indication of linkage between both durum and emmer head characters and resistance to rust infection. A few crossovers giving resistant common-wheat types were obtained. The mode of inheritance of rust resistance is interpreted as Mendelian.—*F. P. Bussell.*

1767. Herlant, Maurice. **Un cas d'hermaphrodisme complet et fonctionnel chez Paracentrotus lividus. [A case of complete and functional hermaphroditism in Paracentrotus**

lividus.] Arch. Zool. Exp. Notes et Rev. **57**: 28–31. *1 fig.* 1918.—Specimen of this sea urchin had three normal testes, one atrophied testis, and large mixed gland. Functional eggs and spermatozoa from mixed gland united in self-fertilization, and from the fertilized eggs normal plutei developed. Eggs of this hermaphrodite also united normally with spermatozoa of normal males, and its spermatozoa fertilized eggs of normal females. Atrophied testis contained parasite, but there was nothing to indicate that hermaphroditism depended on parasitism.—*A. Franklin Shull.*

1768. Hildén, K. **Anthropologische Untersuchungen über die Eingeborenen des russischen Altai. [Anthropological investigations on the natives of the Russian Altai.]** *137 p.* Helsingfors, 1920.

1769. Hogben, Lancelot T. **Studies on synapsis II. Parallel conjugation and the prophase complex in Periplaneta with special reference to the premeiotic telophase.** Proc. Roy. Soc. London **91**: 305–329. *3 pl.* Aug. 7, 1920.—Author studied spermatogenesis and oogenesis in *Periplaneta* (cockroach); first account of the latter. Author does not observe anaphase chromosomes of the late oogonia to be split, in contrast to this condition observed by Miss Digby in the premeiotic anaphase chromosomes of *Osmunda*. There are thirty-two autosomes and two accessory chromosomes in the female, one accessory in the male. Parasynapsis occurs in both sexes; in the female the accessories and autosomes do not behave differently. He observes no twisting filaments in the zygotene stage and believes that the union of the constituent halves of this stage is sufficiently intimate to allow the possibility of crossing over but not by such means as are postulated by the chiasmatype theory. In oogenesis segregation of homologous chromosomes appears to take place in the first maturation division, but has no data to indicate that this occurs in spermatogenesis.—*C. L. Parmenter.*

1770. Hovasse, R. **Le nombre des chromosomes chez les têtards parthénogénétique de grenouille. [The number of chromosomes in parthenogenetic tadpoles of the frog.]** Compt. Rend. Acad. Sci. Paris **170**: 1211–1216. May, 1920.—The author has determined the approximate number of chromosomes in the cells of parthenogenetic tadpoles and gastrulae of *Rana temporaria*. In two tadpoles, aged 50 and 80 days, the number is diploid (24–27) which he interprets as being produced by regulation (Delage), a doubling of the chromosome number very early, perhaps at the beginning of segmentation. In two gastrulae, 8 days old, the number varies from approximately 15 to 28 and the size of the nuclei varies accordingly from 5 to 16 microns in diameter. These numbers he interprets as due to regulation in only a part of the cells. The number of chromosomes in the cells of seven sickly tadpoles, aged 16 days and less, is haploid, and the nuclei are about half normal size. These conditions are cited as very comparable to those obtained by Driesch in parthenogenetic sea-urchin embryos. Delage adds a note emphasizing these data as confirming his regulation theory.—*C. L. Parmenter.*

1771. Howè, Lucien. **The relation of hereditary eye defects to genetics and eugenics.** Jour. Heredity **10**: 379–382. Nov., 1919.—Pointing out the attitude which the ophthalmologist must take in regard to hereditary blindness and showing that sterilization or sequestration of carriers of the defect is legal in some states.—*J. H. Beaumont.*

1772. Hume, A. N. **A system for breeding corn or gregarious animals.** Jour. Heredity **11**: 191–192. April, 1920.—A brief description of a plan for breeding and selection which is fully outlined in South Dakota Experiment Station Bulletin 186 (Bot. Absts. 5, Entry 1532). The plan consists in introducing ears from outside the breeding-plot into the even-numbered detasseled rows, which gives opportunity for testing the yielding power of such introductions before permitting them to contaminate the other "blood lines." The system is especially applicable to poultry where 4 or more pens are used and accurate egg-laying records are kept.—*J. H. Beaumont.*

1773. Jablonski, Walter. **Über Albinismus des Auges im Zusammenhang mit den Vererbungsregeln. [On albinism of the eye in connection with inheritance laws.]** Deutsch. Med. Wochenschr. **46**: 708–711. 1920.

1774. Jelinek. **Nächste Aufgaben der Pflanzenzüchtung und der Sortenprüfung. [The next problems of plant-breeding and variety testing.]** Zeitschr. Pflanzenzücht. 7: 83–90. Dec., 1919.—It has been shown that a variety (of wheat) selected as pure line may show great variations in yield in different years and it has been proposed to mix selected pure lines to secure varieties better than either single pure line or original "Landsorten." Increased yield due to individual reaction of variety or its components to various vegetative factors. This capacity to react differs among various lines of a variety and is hereditary. Relation of inherent reaction to vegetative factors may be shown graphically by Stempel type of "correlation curve." Limiting values which indicate range of correlation curve and which form limiting conditions of existence for variety are called "vegetation limits" of variety or line. The "renting capacity" of variety is conditioned by limiting minimum and maximum values of vegetation factors, defined by harvest value and its production costs. "Renting capacity" is necessarily not constant. Lines with narrow vegetation limits have also narrow renting capacities but lines with broad vegetation limits may have narrow or broad renting capacity according to whether the correlation curve rises and falls quickly or gradually at either end. Limits between which vegetative factors of locality vary relatively to soil and varying weather condition in any year are termed "vegetation limits of the locality." Varieties with narrow correlation curve react very easily to changes of growth conditions and may be designated as irritable varieties; and conversely, plastic varieties exist. In selecting varieties for any locality care should be taken that varietal renting capacity is not narrower than vegetation limits of given region. Sufficient plasticity of any variety is important in agricultural practise, especially where growth conditions vary widely. Pure lines are necessarily non-plastic. If highest type variety is to consist of selected mixture ("individually selected population") of pure lines, then parent variety must be preserved in original condition. Certain difficulties would attend formation of proper mixture of lines but these should not be considered insuperable.—*L. R. Waldron.*

1775. Johnson, Charles W. **Variation of the palm weevil.** Jour. Heredity 11: 84. *1 fig.* 1920.—Palm weevils (*Rhynchophorus cruentus* Fabr.) were collected showing practically continuous color intergradations.—*J. H. Beaumont.*

1776. Johnson, James. **An improved strain of Wisconsin tobacco. Connecticut Havana No. 38.** Jour. Heredity 10: 281–288. *Fig. 8–10.* June, 1919.—Seed from about thirty-five self-fertilized plants of Connecticut Havana tobacco were sown in progeny rows and it became evident that three types were represented in the progeny. Two types differed from the normal and were constant in later generations. They are undoubtedly mutations. A cross between these gave an intermediate which in two years and among large numbers did not segregate, though exact data were not taken. Seed was distributed and in 1919 it has displaced other strains of tobacco. [See also Bot. Absts. 7, Entry 1694.]—*J. H. Beaumont.*

1777. Jones, D. F. **The effect of inbreeding and crossbreeding upon development.** Proc. Nation. Acad. Sci. 4: 246–250. *2 fig.* Aug., 1918.—Continuing inbreeding experiments of East and Hayes, author finds no further reduction in vigor after eight inbred generations. Two inbred lines, though less productive than original parents, are still quite fertile; others have run towards either pollen or ovule abortion. Crossing different inbred lines enormously increases vigor, frequently bringing gain in yield of 180 per cent. Mixtures of own and foreign pollen, applied to silks of both parents, result in selective fertilization favoring own pollen.—*Merle C. Coulter.*

1778. Jones, D. F. **Heritable characters of maize. IV. A lethal factor—defective seeds.** Jour. Heredity 11: 161–167. *7 fig.* April, 1920.—A factor, development of pericarp but incomplete development or complete suppression of embryo and endosperm, is to be distinguished from partially developed ovules due to incompleted growth or ineffective fertilization. If genetically defective seeds appear on a self-fertilized plant they will be in approximately the ratio 3:1. Several other factors may be operating, however, so that much more work must be done to check up the inheritance of this factor.—*J. H. Beaumont.*

1779. Jones, D. F. **Sterility in animals and plants.** Sci. Amer. Monthly **2**: 117–119. *7 fig.* 1920.—Hereditary lethal factors, when received from both parents, prevent development of offspring.—*Chas. H. Otis.*

1780. Jones, D. F. **Segregation of susceptibility of parasitism in maize.** Amer. Jour. Bot. **5**: 295–300. June, 1918.—Segregates from long-inbred maize show striking differences in susceptibility to corn smut and an unidentified leaf blight. Crosses with resistant strains give approximately resistant F_1 and segregation again in F_2. Indicates susceptibility commonly recessive, being segregated in some lines and not in others. Supports his earlier hypothesis that increased development shown by hybrids is due to conjunctive action of large number of favorable, dominant growth factors contributed by both parents.—*Merle C. Coulter.*

1781. Jones, D. F., and W. O. Filley. **Teas' hybrid Catalpa.** Jour. Heredity **11**: 16–24. *6 fig.* 1920.—J. C. Teas, of Carthage, Missouri, grew seed of *Catalpa Kaempferi* which was growing near the two North American species *C. bignonioides* and *C. speciosa* and obtained a vigorous-growing hybrid. The parentage has been established by Dr. E. M. East and H. K. Hays who made the back-cross *C. bignonioides* × *C. Kaempferi* and obtained a similar hybrid. These hybrids are more hardy and more rapid-growing than either parent but are intermediate in most of the fruit, flower and tree characters which add, however, to its value as an ornamental.—*J. H. Beaumont.*

1782. Jordan, David Starr. **War and genetic values.** Jour. Heredity **10**: 223–225. May, 1919.—A denunciation of the theories of Dr. McFie, Dr. Thorstein Veblen, and others, who contend that war does not affect the eugenic level of a race or nation. The writer contends that war does remove many of the higher intellects and combined with the corollary losses due to war is detrimental to the moral and intellectual status of the nation. His theme is: "Restoration in quantity is a matter of time, but restoration in quality, in values, moral, mental, and physical, will be a much longer and more difficult process."—*J. H. Beaumont.*

1783. Kalt, B. **Die Hintertuxergerste. Ein Anbau- und Züchtungsversuch. [Hintertux barley. A cultural and breeding experiment.]** Kühn-Arch. **7**: 217–240. 1918.—Author reports observations on a barley raised from seed grain secured from station of 1500 m. altitude. Plants proved a very early-maturing form of *Hordeum distichum nutans* having long stem, long, open, heavy heads, long, heavy grain, little tillering (Bestockung), and high nitrogen content. Last two characteristics considered not desirable. It is now planned by breeding to increase tillering in this barley without decreasing earliness, and to lower nitrogen content. [From anonymous review in Zeitschr. Pflanzenzücht. **7**: 39–40. June, 1919.]—*James P. Kelly.*

1784. Kammerer, Paul. **Dunkeltiere im Licht und Lichttiere im Dunkel. [Darkness animals in light and light animals in darkness.]** Naturwissenschaften **8**: 28–35. *5 fig.* 1920.—Reviews and spiritedly defends against critics his interpretation of results of experiments published in 1912. The Austrian cave salamander, *Proteus*, normally has a small eye which in the adult is about double in size that of the young but the overlying thick skin contains the usual glands, sense organs, and slime cells and renders the eye difficult to find. The lens cells undergo some degeneration. Twenty-three young, born and reared in a cistern at the Vienna station, had distinct but very small eyes. In daylight the skin becomes black but the eyes are really in darkness under the skin. Only such light, e.g., that from a red incandescent bulb, as does not cause pigment development, will continue to illuminate the eye fully. Author exposed one *Proteus* five years to a red incandescent light and five individuals alternately to red light and daylight. The latter developed some pigment but not enough to shield the eyes from light. Figure of one of these individuals shows a prominent eye. Lens in one subjected to red light was 18 times longer and 12½ times wider than in normal; lens fibers attached to ciliary body; a true cornea and iris with pupil; skin over eye thin, transparent, and lacking in glands, etc. The eye stands out like a glass ball and has the

retina well developed. "Light *Proteus*" see, as proved by feeding experiments with earthworms in outer tank while *Proteus* was confined in an inner glass tank without water connection. No attempt was made to get offspring in darkness from the large-eyed *Proteus*, though the author scarcely doubted that positive results would have been obtained; he however despaired of contributing anything new to solution of problem of inheritance of acquired characters.—Author cites many cases which he holds bear upon the effect of cave environment upon organisms and does not doubt that their modifications are hereditary effects of environmental influences. In reply to his critics regarding the possibility that the individuals with large eyes represented genetically different material, the author states that the 6 reared in red light alone developed the large eyes while 40 others of the same material reared in darkness did not do so.—*A. M. Banta.*

1785. Keith, A. **The mathematician as an anatomist.** [Rev. of: Pearson, Karl, and Julia Bell. **A study of the long bones of the English skeleton.** Department of applied statistics. University of London, University College: Drapers Company research memoirs, Biometric series, **10.** *Text pt. 1, v + 224 p.; Atlas pt. 1, vii + 59 pl., + tables.* **11.** *Text pt. 1, sec. 2, 225–539; atlas pt. 1, sec. 2, vii + pl. 60–101 + tables.* University Press: Cambridge, 1919.] Nature **105**: 767–770. 1920.—Reviewer has been collecting data from all systems of the Primate body (see Nature **75**: 508. 1911). His results are, in the main, in harmony with those of Pearson. We lack data regarding possible correlation of individualities in the human gait with structural variations of the thigh bone.—*O. A. Stevens.*

1786. Kelly, James P. **A genetical study of flower form and flower color in Phlox Drummondii.** Genetics **5**: 189–248. *2 colored pl., 13 fig.* Mar., 1920.—Reference is made to investigations of Gilbert (Jour. Agric. Res. **4**: 293–302. 1915) who carried three crosses through the F_2 generation and assumed five factors to explain his observations.—Author finds that variety *cuspidata* having deeply incised petals is a simple Mendelian recessive to varieties having entire petals; that so-called variety *fimbriata* is a "monoheterozygote of the entire and *cuspidata* types" and hence is unfixable; that color in the petals of *fimbriata* and *cuspidata* types is confined to the papillated epidermal cells which do not completely cover the mesoderm.—Funnel-shaped corolla is a simple recessive to salver-shaped corolla.—Crossing of strains A and B, both of which have white flower-blades, and of strains A and J, the former having white flower-blades and the latter light pink, gave in each case a different full-colored F_1 type. F_1 of strains A × B proved heterozygous for *P*, a chromogen factor, *E*, an enzyme factor, and *A*, an activator for *E*, these factors being necessary for blade color. Type of blade color varies according to nature of chromogen base. Action of *E* and *A* on *P* produces a full-colored blade; on *D*, a different chromogen base, gives both stippled and unstippled blades; on *R*, a third chromogen base, gives a different blade color. In AB and EF series interaction of chromogen bases *P* and *D* together with *E* and *A* gives a distinct full-colored type. Similarly in AJ series blade color due to factors *REA* + color due to *DEA* gives a distinct full-colored type. In AB and EF series a bluing factor (or linked factors), which is independent of the essential blade-color factors, doubles the number of color types and modifies the reddish blade color to a bluish color. Dark-eyed and light-eyed forms differ by a single factor. In some cases this factor intensifies blade color. Cream-colored blade is a simple recessive to white blade. Author reports fourteen chromosomes in somatic cells of *Phlox Drummondii.*—*Ernest Dorsey.*

1787. Kempton, J. H. **Heritable characters of maize. III. Brachytic culms.** Jour. Heredity **11**: 111–115. *4 fig.* Mar., 1920.—The character appeared in a Chinese-Algerian hybrid "Dh 416" and consists of a shortening of the internodes on the main culm without a corresponding reduction in number or in size of other organs. The character behaves as a simple Mendelian recessive. Brachytic variations are found in "bush" peas, beans, squashes and tomatoes and are to be distinguished from dwarfing. Author cites two other cases of brachytic variation neither of which bred true; one segregated in a normal frequency curve in F_2, while the other gave only a few brachytic plants. [See also Bot. Absts. 7, Entry 1696.] —*J. H. Beaumont.*

1788. Klebahn, H. **Impfversuche mit Pfropfbastarden. [Infection experiments with graft hybrids.]** Flora 111–112: 418–430. 1918.—See Bot. Absts. 7, Entry 1800.

1789. Koltonški, Hermann. **Über Erblichkeit der Ovarial-, besonders der Dermoidcysten. [On the inheritance of ovarial cysts, especially the dermoid cysts.]** Zeitschr. Krebsforsch. 17: 408–416. 1920.

1790. Kotowski, Feliks. **Zmiennósč i Korrelacye w "czystej linii" pszenicy. Tr. vulgare Ostka biala dublańska. [Correlation and variability in a pure line of wheat.]** Polnisch: Tygodnika Rolniczy, Krakau 1919.—See Bot. Absts. 7, Entry 1702.

1791. Kuttner, O. [German rev. of: Woltereck, Rich. **Variation und Artbildung. Analytische und experimentelle Untersuchungen an pelagischen Daphniden und anderen Cladoceren. Erster Teil: Morphologische, entwicklungsgeschichtliche und physiologische Variations-Analyse. (Variation and species formation. Analytical experimental studies on pelagic Daphnias and other Cladocera. Part I. Analysis of morphological, embryological, and physiological variation.)** *145 p., 6 pl., 55 fig.* Bern, 1919.] Zeitschr. Indukt. Abstamm. u. Vererb. 24: 179–182. Sept., 1920.

1792. Laughlin, Harry H. **Calculating ancestral influences in man. A mathematical measure of the demonstrated facts of bisexual heredity.** Proc. Nation. Acad. Sci. [U. S.] 6: 235–242. *2 charts.* May, 1920.—An abstract of a more extensive discussion not yet published. "The principles set forth" in the larger paper, "make possible the mathematical formulation of an indefinitely great number of complex situations in reference to ancestral influence," of which twenty-seven formulae have been developed. The application of eight of these to the first five ancestral generations in man have been worked out and charted. The present abstract reproduces the eight formulae with accompanying charts showing the result of their application to the first three ancestral generations of man.—The calculations are based on the assumption of 24 somatic chromosomes with sexual heterozygosity in the male and without provision for mutation, crossing over, etc., as such special phenomena are not yet measurable in man and the "present forumlae will not be upset by such corrections" when later introduced. The formulae as set forth are foundational and are stated in general terms applicable to all forms of bisexual heredity.—*Howard J. Banker.*

1793. Laughlin, Harry H. **Population schedule for the census of 1920.** Jour. Heredity 10: 208–210. 1919.—A proposed addition by eugenists and genealogists to the general enumeration of the census which would record the name of the father and the maiden name of the mother of every person enumerated. This would permit analysis of census returns on the personal and family-history basis. The reasons and benefits for such enumerations are given as stated and unanimously adopted by the Eugenics Research Association.—*J. H. Beaumont.*

1794. Laurie, D. F. **Evolution, heredity and breeding.** Jour. Dept. Agric. South Australia 23: 692–697. 1920.—The writer emphasizes the importance to workers in heredity of the investigations of biochemists. He cites Morgan's castration experiments on Seabright cocks as indicating that the Mendelian "factor" inhibiting the appearance of a character is located in the testes and due to hormonic influence. Luteal cells are present in the testes of the hen-feathered cocks. He quotes the address of Professor A. Keith at the British Association at Bournemouth (Nature, Nov. 13, 1919) in which the predominance of certain distinctive features of the three types,—European, Chinaman, and Negro—are attributed to the influence of the organs of internal secretion. "If the selective action of *alpha* proteins in food in regard to the activity or repression of the organs of internal secretion which are known to affect growth, and normal or abnormal developments, is ultimately proved, then Mendelians are faced with a difficult position in regard to the continuity of the germ-plasm. Nothing can be added. On the other hand, Bateson's view of the shedding of inhibiting factors may not be affected, because, except in pathological or post-operative conditions, the factor would not be influenced by immediate endocrinal action."—*A. F. Chidester.*

1795. Leake, H. Martin, and B. Ram Pershad. **A preliminary note on the flower colour and associated characters of the opium poppy.** Jour. Genetics **10**: 1–20. *1 pl.* July, 1920.—On basis of color and its distribution authors arrange Indian poppies in five groups: (1) *White-eyed group*, due to two factors *P* and *R*. *P* alone determines pink margin to petal and lacks dominance, giving light pink heterozygotes. *R* is intensifier of *P* and in absence of latter gives no visible results. Factor *R* possesses dominance but its results are deep or light depending on duplex or simplex condition of *P*. (2) *Purple group*, dependent on presence of genes *M* and *L* and absence of *P*. *M* shows complete dominance and develops mauve purple in margin with a deeper eye. *L* intensifies results of *M* giving magentas. (3) *Dilute color group*, where *P* and *M* are present and *L* absent. *R* is inhibited in presence of *M*. Marginal color is dilute and eye colored. (4) *Full color group*, factorially like last but with *L* in addition. Two of subsidiary variations within this group dependent on homo- or heterozygosity of *P* as was true also of third group. (5) *White-flowered group*, whose genetic diversity is mentioned. The securing of extracted whites from two pure [homozygous] colored plants points to two independent anthocyan bases.—Factor *P* is correlated with short vegetative period. Groups 1 and 5 are white-seeded, while 2, 3, and 4 have colored seeds. Laciniated petal is simple dominant to entire petal. Small, more or less sepaloid petals seemed a simple recessive.—*James P. Kelly.*

1796. Lehmann, Ernst. **Variabilität und Blütenmorphologie. [Variability and floral morphology.]** Biol. Zentralbl. **38**: 1–38. Jan., 1918.—Author reviews literature (120 titles in list) relating to morphology and variability of flower beginning with Linnaeus who emphasized the typical, outlawed large variations, labelling them as monstrous or teratological, and ignored small variations. Goethe's plea that normal and abnormal be treated together is given prominence. De Candolle and von Mohl are cited as agreeing with Goethe. Author points out looseness of usage of terms *monstrosity* and *deformity* and approves Stenzel's substitution of *deviation*, *abnormality*, and *anomaly*. In case of last two terms further analysis was made possible especially by Vöchting who introduced a statistical treatment. Now a relatively infrequent case that fits into a Gaussian distribution is named, following Klebs, simply a *variation* just as are narrower and commoner deviations. Author surveys applications that have been made of statistical methods to flowers. Originally numerical evaluation limited to type [mode]. Cockerell, Burkill, and Ludwig were among first to use mean. De Vries did pioneer work on character of curves of distribution. Verschaffelt first directed attention to degree of variability in floral cycles using the quartile, but later many authors used σ. Much has been done on causes of floral variation: soil conditions, light, temperature, heredity, age of plant. Lastly, correlation is treated, especially work on Crassulaceae by Klebs, on *Ficaria*, *Paris*, and *Parnassia*.—*James P. Kelly.*

1797. Leighty, Clyde E. **Natural wheat-rye hybrids of 1918.** Jour. Heredity **11**: 129–136. *Fig. 19–22.* Mar., 1920.—Hybrids between wheat and rye are rare but in 1918 nineteen instances were found at Arlington Farm and three at the Virginia Agricultural Experiment Station. It is evident from a comparative analysis of the plants that they are hybrids of wheat as the female parent and rye. The hybrids are one to five per cent fertile and some F_2 generation plants are being grown. [See also Bot. Absts. 7, Entry 1703.]—*J. H. Beaumont.*

1798. van der Lek. [Dutch rev. of: Fischer, Ed. **Der Speziesbegriff und die Frage der Spezies-Entstehung bei den parasitischen Pilzen. (The species concept and the question of the origin of species in the parasitic fungi.)** Verhandl. Schweiz. Naturf. Ges. 98 Jahresversammlung.] Genetica **2**: 459–462. Sept., 1920.

1799. van der Lek. [Dutch rev. of: Francé, R. H. **Der Parasitismus als schöpferisches Prinzip. (Parasitism as a creative principle.)** Centralbl. Bakt. **59**: 54–64. *6 fig.* 1920.] Genetica **2**: 462–464. Sept., 1920.

1800. van der Lek. [Dutch rev. of: Klebahn, H. **Impfversuche mit Pfropfbastarden. (Infection experiments with graft hybrids.)** Flora 11/12: 418–430. 1918. (See Bot. Absts. 3, Entry 2124; 4, Entry 3512.)] Genetica **2**: 468–471. Sept., 1920.

1801. van der Lek. [Dutch rev. of: Tisdale, W. H. **A study of the nature and inheritance of wilt resistance.** Jour. Agric. Res. 11: 573–603. *3 pl., 8 fig.* 1917.] Genetica 2: 478–480. Sept., 1920.

1802. Lenz, Fritz. **Oskar Hertwigs Angriff gegen den "Darwinismus" und die Rassenhygiene.** [Oskar Hertwig's attack on Darwinism and race hygiene.] Arch. Rass.- u. Gesellschaftsbiol. 13: 194–203. 1920.

1803. Lenz. [German rev. of: Fleischer, B. **Über myotonische Dystrophie mit Katarakt.** (On myotonic dystrophy with cataract.) Arch. Ophthalmol. 96: 1–43. 1918.] Arch. Rass.- u. Gesellschaftsbiol. 13: 208. 1920.

1804. Lenz. [German rev. of: Schallmayer, W. **Vererbung und Auslese. Grundriss der Gesellschaftsbiologie und der Lehre vom Rassedienst.** (Heredity and selection. Fundamentals of social biology and science of race improvement.) *3rd ed., 8 vo, xvi + 536 p.* Gustav Fischer: Jena, 1918. (See Bot. Absts. 2, Entry 704.)] Zeitschr. Indukt. Abstamm. u. Vererb. 24: 297–300. Nov., 1920.

1805. Lenz. [German rev. of: Siegel, P. W. **Gewollte und ungewollte Schwankungen der weiblichen Fruchtbarkeit. Bedeutung des Kohabitationstermines für die Häufigkeit der Knabengeburten.** (Intentional and unintentional variations in female fecundity. Significance of the time of intercourse for the frequency of male births.) *197 p.* J. Springer: Berlin, 1917.] Arch. Rass.-u. Gesellschaftsbiol. 13: 221–225. 1920.

1806. Leverenz, C. **Die meistgebauten landwirtschaftlichen Pflanzenzüchten Deutschlands mit Ausnahme der Kartoffeln.** (The most frequently cultivated agricultural plant breeds of Germany, with exception of potatoes.] Landwirtschaftskammer Provinz Sachsen. *79 p.* Hermann Kuhnt: Halle, 1920.—See Bot. Absts. 7, Entry 1704.

1807. Levy, Fritz. **Die Kernverhältnisse bei parthenogenetischen Fröschen. Ein Beitrag zur Physiologie und Pathologie der Zelle.** [The nuclear relations in parthenogenetic frogs. A contribution to the physiology and pathology of the cell.] Sitzungsber. Preuss. Akad. Wiss. Berlin 1920: 417–425. 1920.

1808. Little, C. C. **A note on the origin of piebald spotting in dogs.** Jour. Heredity 11: 12–15. *1 fig.* 1920.—Piebald spotting may be altered in extent by selection within a race showing a minute degree of spotting, but since the factor is hypostatic it will not appear in a self-colored race unless by recombination or mutation. Two cases, a spotted Scottish terrier puppy and spotted puppies in two litters of Airedale terriers, are given with their pedigrees, with an explanation of which of the parents may have been responsible in bringing in the hypostatic factor.—*J. H. Beaumont.*

1809. Lotsy, J. P. **Over Gallus temminckii G. R. Gray en over de eikleur der wilde Hoenderlinneonten.** [Gallus temminckii G. R. Gray and the egg color of the wild Linnean species of fowl.] Genetica 2: 400–404. *1 fig.* Sept., 1920.

1810. Lubosch, Wilhelm. **Das Problem der tierischen Genealogie. Nebst einer Erörterung des genealogischen Zusammenhanges der Steinheimer Schnecken.** [The problem of animal genealogy. Also a statement of the genealogical relations of the Steinheim snails.] Arch. Mikrosk. Anat. 94: 459–499. 1920.

1811. Lühning. **Die erbliche Geschlechtsverknüpfung.** [Hereditary sex-determination.] Deutsch. Landw. Tierzüchtg. 22: 77–78. 1918.—Author argues that the sex of offspring is determined by that of the weaker of the parents as the race would become extinct if the reverse were true. He holds that in general offspring inherit their characteristics largely from the parent of the opposite sex. Inheritance of thick lower lip of the Habsburgs is discussed briefly as illustration.—*Sewall Wright.*

1812. MacLeod, J. **The quantitative method in biology.** *15 × 23 cm., v + 228 p., 27 fig.* Longmans, Green & Co.: New York, 1919.—The thesis taken by the author is that all classified groups, species, etc.; all variation, Mendelian or otherwise; in fact all biological phenomena, should be measured and reduced to constants, similar to those of the physicist. These constants will then form the basis of exact description necessary to further biological progress.—Up to the present, the great variation of biological phenomena has barred the application of this method. Preliminary study of the specimen reveals certain *primordia*, or simple elementary properties of characters, which are to be measured in order to find the constants mentioned above. The primordia for each subject are to be determined independently by preliminary study.—The rest of the book is given over to expansion and illustration of this thesis. Discussion of quantitative methods is merely a side issue, only the simplest of them being used for illustration purposes. [See also Bot. Absts. 4, Entries 758, 3528.]—*John W. Gowen.*

1813. Matthews, J. R. **Hybridism and classification in the genus Rosa.** New Phytol. 19: 153–171. July–Oct., 1920.—Classification of roses is complicated by natural hybridization, for which there is abundant opportunity. A number of *Rosa* species are now acknowledged hybrids due to their intermediateness. Others are suggested by sterility, on basis of Jeffrey's "crypthybrid" principle. Author classifies genus in 5 sections and 18 groups. Members of each group differ in only a few unit characters. For each group author uses some or all of the following unit characters, and shows that majority of combinations theoretically possible have already been recognized and usually given specific names: hairy vs. glabrous leaflets (*Hh*); biserrate vs. not biserrate (*Bb*); presence vs. absence of foliar glands (*Gg*); hispid vs. smooth peduncles (*Ss*). Believes morphological methods alone insufficient for solution of problems involved; emphasizes need of breeding work, upon which new classification should be based, involving return "to the Linnean conception of the species, denoting its various combinations by some purely symbolical method."—*Merle C. Coulter.*

1814. Merriman, Mabel L. **Studies in the conjugation of Spirogyra ternata.** Bull. Torrey Bot. Club 47: 9–20. *3 fig.* January, 1920.—Records differences in form and volume of male and female gametangia in *S. ternata.* Suggests that differences may be due to differences in metabolism.—*E. N. Transeau.*

1815. O'Neal, C. E. **Microsporogenesis in Datura stramonium.** Bull. Torrey Bot. Club 47: 231–241. *2 pl.* 1920.—The maturation stages are found in anthers 2 to 4 mm. long. The diameter of the pollen-mother-cells in the resting stage is about 25 microns. Synizesis is figured. Doubleness of the spireme thread was visible before its segmentation. Twelve bivalents were counted, and no differences in shape or size were made out. In the spindles of the second division the chromosomes are evenly spaced, and have "an almost diagrammatic appearance." [See Bot. Absts. 6, Entry 1001.]—*John Belling.*

1816. Orban, G. **Untersuchungen über die Sexualität von Phycomyces nitens. [Sexuality of Phycomyces nitens.]** Beih. Bot. Centralbl. 36: 1–59. *2 pl., 20 fig.* 1919.—Author attempts to make a more thorough investigation of processes of sexual reproduction already known in *Phycomyces nitens.* The sexes are distinguished by secondary sexual characters which are constant for all (+) and (−) races, even for those obtained by germination of zygospores. Cultural conditions influencing strength of zygosporic line between heterothallic races are investigated. Homothallic mycelia are studied in detail in regard to production of pseudophores, formation of zygospores entirely from homothallic filaments or jointly from homothallic and heterothallic filaments, formation of azygospores and sporangia and changes in sexual reaction from homothallic to heterothallic. On certain substrata pseudophores are formed at line of contact between (+) and (−) races.—*A. F. Blakeslee.*

1817. Patterson, J. T. **Polyembryony and sex.** Jour. Heredity 10: 344–352. *Fig. 4–5.* 1919.—The author gives data of the numbers of male, female, and mixed broods of three species of parasitic hymenoptera: *Copidosoma gelechiae, Paracopidosomopsis floridanus,* and *Platy-*

gaster sp. The data show a proportion of mixed broods which cannot be explained in all cases by a deposition of two eggs by two different females or by two kinds of eggs by the same female. The hypothesis of non-disjunction of Bridges is compared with the two-egg hypothesis in the case of *Platygaster*, which forms all mixed broods having a small proportion of males. The final solution must be found through cytological studies.—*J. H. Beaumont.*

1818. Phipps, W. H. **Blending colors in flowers.** Flower Grower 7: 76. *1 fig.* 1920.—Article contains chart showing results of mixing different pigments or various spectrum hues and urges hybridizers to use such knowledge in choosing parent plants. Author says, "If you want a cream color you pollinate a white with a light yellow. If a scarlet is desired you will pollinate a red flower with a yellow flower."—*J. P. Kelly.*

1819. Poll, Heinrich. **Mischlingstudien VIII. Pfaumischlinge, nebst einem Beitrag zur Kern-Erbträger-Lehre. [Hybridization studies VIII. Pea-fowl hybrids and a comment on the theory of nuclear bearers of heredity.]** Arch. Mikrosk. Anat. 94: 365–458. *5 fig.* 1920.—A detailed study of two peacock-guinea-hen hybrids, both males, reared at the Berlin Zoological Gardens. Study includes observations on the living birds and microscopic examination of the testes; also review of other cases and literature on generic crosses in the Phasianidae. The peacock-guinea-hen hybrids were very similar, in general intermediate, but so different from either parent that if found wild they would be adjudged new species. They lack both the crest of the peacock and the head wattles of the guinea. Spermatogenesis in the hybrids ends with synizesis; the strepsinema stage is entirely lacking.—A large portion of the paper is devoted to a polemic defense of the author's use of the stage of spermatogenesis reached in the hybrids as a measure of the true genetic relationship of the parents. A redefinition of terms is given. Applying the method to the Phasianidae, it is concluded that the guinea is more closely related (genetically) to the fowl than to peacock or pheasant (relationship value = 2); and more closely to the peacock (relationship value = 3) than to the pheasant (relationship value = 4). The distances of the fowl from peacock, peacock from pheasant and pheasant from fowl are all placed at 4 as a minimum.—*Leon J. Cole.*

1820. Przibram, Hans. **Het ontstaan, de inrichting en de werking van het in het Weensche Vivarium ondergebrachte Instituut voor Biologisch Onderzoek. [The origin, organization and work of the Institute for Biological Research brought into the Vivarium of Vienna.]** Genetica 2: 405–450. Sept., 1920.

1821. Rabaud, E. **Recherches sur l'hérédité et la variation. Étude expérimentale et théorie physiologique. [Studies on heredity and variation. Experimental study and physiological theory.]** Bull. Biol. France et Belgique Suppl. 1. *313 p.* 1919. [See Bot. Abst. 7, Entry 1838.]

1822. Rasmusson, H. [German rev. of: Dahlgren, K. V. Ossian. **Erblichkeitsversuche mit einer dekandrischen Capsella bursa-pastoris (L). (Genetical investigations with a decandrous Capsella bursa-pastoris (L).)** Svensk. Bot. Tidsskr. 13[1]: 48–60. *2 fig.* 1919. (See Bot. Absts. 3, Entry 616.)] Zeitschr. Indukt. Abstamm. u. Vererb. 24: 178–179. Sept., 1920.

1823. Rasmusson, H. [German rev. of: Kajanus, Birger. **Ueber eine Kreuzung zwischen zwei Typen von Sommerweizen. (On the crossing of two types of spring wheat.)** Bot. Notiser 1918: 245–247. Nov., 1918. (See Bot. Absts 3, Entry 1007.)] Zeitschr. Indukt. Abstamm. u. Vererb. 24: 178. Sept., 1920.

1824. Renner, Otto. **Oenothera Lamarckiana und ihre Bedeutung für die Mutationstheorie und für die Bastardforschung. [Oenothera Lamarckiana and its significance for the mutation theory and for hybridization studies.]** Sitzungsber. Ges. Morph. u. Physiol. München 31: 3–8. 1920.

1825. Renner, O. [German rev. of: de Vries, Hugo. **New dimorphic mutants of the Oenotheras.** Bot. Gaz. 62: 249–280. *5 fig.* 1916.] Zeitschr. Indukt. Abstamm. u. Vererb. **24:** 170–172. Sept., 1920.

1826. Renner, O. [German rev. of: de Vries, H. **Über monohybride Mutationen. (On monohybrid mutations.)** Biol. Centralbl. **37:** 139–148. 1917. Idem. **Mutations of Oenothera suaveolens Desf.** Genetics **3:** 1–26. *4 fig.* Jan., 1918. (See Bot. Absts. 1, Entry 19.)] Zeitschr. Indukt. Abstamm. u. Vererb. **24:** 172–175. Sept., 1920.

1827. Riolle, Y. Trouard. **Les hybrides de Raphanus.** [Raphanus hybridus.] Rev. Gén. Bot. **32:** 438–447. *Fig. 1–3.* 1920.

1828. Rosanoff, Aaron J. **A theory of personality based mainly on psychiatric experience.** Psychol. Bull. **17:** 281–299. Sept., 1920.—The author maintains that his evidence shows the four defined abnormal types of personality known as the antisocial, cyclothymic, autistic, and epileptic, bear to one another in their blending, relationships analogous to those of coat colors in mice. The most striking feature these varieties of neuropathic constitution have in common is their behavior as Mendelian recessives in relation to normal constitution, the degree of inhibition of manifestation constituting, however, a homogeneous group of Mendelian units. Therefore Bateson's terms epistatic and hypostatic are preferable to dominant and recessive.—Manic-depressive parents often have schizophrenic offspring, rarely the reverse, suggesting an epistatic position for them, but epilepsy apparently occupies a hypostatic position not only in relation to the normal but to all constitutional psychoses.—Mixed conditions are combinations of traits occupying contiguous positions in the scale of dominance. Epileptic phenomena are more often seen in dementia praecox (autistic type) than in manic-depression (cyclothymic type), and autistic phenomena more often in manic-depression than in psychoneurotic (antisocial) cases. So also rudimentary psychoneurotic symptoms are more often seen in normal individuals than are the other kinds of phenomena. The facts of ontogeny seem to show that latent neuropathic elements of personality are, in various combinations and degrees, regular components of so-called normal personality and are particularly susceptible to release through the action of alcohol.—The psychological test data from the author's patients at Kings Park State Hospital show that any degree of intellectual capacity may be transmitted to either of the types of make-up, but the relative frequency of feeble-mindedness seems to increase with descent in the scale of dominance, presumably due to the loss of epistatic factors which are not always made up quantitatively by hypostatic ones.—Nomadism is correlated with the antisocial, autistic, and epileptic constitutions. Handsome physical features are particularly correlated with the cyclothymic type.—Concerning sex-linked traits of personality the author speaks of criminality, drug addiction and autistic psychoses as more frequent in men, while hysteria and cyclothymic tendencies appear more prevalent in women.—*Miriam C. Gould.*

1829. Roux, Wilhelm. **Bemerkungen zur Analyse des Reizgeschehens und der funktionellen Anpassung sowie zum Anteil dieser Anpassung an der Entwicklung des Reiches der Lebewesen.** [Suggestions toward an analysis of stimulation and functional adaptation as well as toward the participation of this adaptation in the development of the realm of living beings.] Arch. Entwicklungsmech. Org. **46:** 485–536. 1920.

1830. Saunders, Edith R. **Multiple allelomorphs and limiting factors in inheritance in the stock (Matthiola incana).** Jour. Genetics **10:** 149–178. *2 pl., 3 fig.* Aug., 1920.—Results indicate a case of multiple allelomorphism involving the genes *H* (hoary), H_1 (half-hoary), and *h* (glabrous). The data are as follows for the locus or loci under consideration. Among 319 plants in F_2 from hoary × half-hoary none were glabrous (and none of a fourth class possible if hoary and half-hoary were not allelomorphic). Crosses involving hoary-half-hoary heterozygotes by half-hoary-glabrous heterozygotes gave 134 plants, none glabrous. Crosses involving heterozygotes for hoary-half-hoary by homozygous half-hoary gave two classes of plants, 37 of one (hoary) and 45 of the other (mid-hoary). Crosses involving heterozygotes

for half-hoary and glabrous gave 1004 plants, none hoary (and none of a fourth class possible if half-hoary and glabrous were not allelomorphic). Crosses involving half-hoary-glabrous heterozygotes by homozygotic glabrous gave 43 plants, none hoary (and none of a possible fourth class). Data on hoary by glabrous crosses are not given in the present paper. Reviewer has omitted data from experiments in which the results were obscured. Thus, when the proof for the allelomorphism of the genes under consideration depends upon the non-appearance in a cross of a certain class other known genes for such a class must not be involved in the experiment.—*Edgar Altenburg.*

1831. Schaffner, J. H. **Dioeciousness in Thalictrum dasycarpum.** Ohio Jour. Sci. **20**: 25–34. Dec., 1919.—This form is dioecious, but sex intermediates of any grade can be found in the field. Same diversity among various branches of single individual. Author gives phylogenetic survey of heterosporous plants, bringing out transitions from bisporangiate to dioecious condition. Emphasizes hopelessness of any factorial explanation of sex in plants. Discourages intimate study of sex in any single form which is not backed by appreciation of its phylogenetic relationships.—*Merle C. Coulter.*

1832. Schallmayer, W. [German rev. of: Ziegler, H. E. **Die Vererbungslehre in der Biologie und in der Soziologie. Ein Lehrbuch der naturwissenschaftlichen Vererbungslehre und ihrer Anwendungen auf den Gebieten der Medizin, der Genealogie und der Politik, zugleich. 2. Aufl. der Schrift über die Vererbungslehre in der Biologie. Zehnter (Schluss) Teil des Sammelwerkes "Natur und Staat."** (Genetics in biology and sociology. A text book of genetics and its applications in the fields of medicine, genealogy and political science, being the 2nd edition of the work on "Genetics in biology" and tenth (concluding) part of the general work "Nature and the State." *xvi + 479 p., 8 partly colored pl., 114 fig.* Gustav Fischer: Jena, 1918. (See Bot. Absts. 2, Entries 923, 963; 3, Entry 1513.) Arch. Rass.- u. Gesellschaftsbiol. **13**: 204–208. 1920.

1833. Schindler, Franz. **Handbuch des Getreidebaus auf wissenschaftlicher und praktischer Grundlage.** [Handbook of grain culture on scientific and practical principles.] *2nd ed., i + 491 p., 180 fig.* Paul Parey: Berlin, 1920.

1834. Schmidt, Johs. **Racial investigations. III. Experiments with Lebistes reticulatus (Peters) Regan.** Compt. Rend. Trav. Lab. Carlsberg **14**[4]: 1–18. 1919.

1835. Schweisheimer, W. **Bevölkerungsbiologische Bilanz des Krieges 1914/19.** [Populational effects of the war 1914-1919.] Arch. Rass.- u. Gesellschaftsbiol. **13**: 176–193. 1920.

1836. Seiler, J. **Geschlechtschromosomen-Untersuchungen an Psychiden. I. Experimentelle Beeinflussung der geschlechtsbestimmenden Reifeteilung bei Talaeporia tubulosa Retz.** [Sex chromosome investigations on psychids. I. Experimental influencing of the sex-determining maturation division in Talaeporia tubulosa Retz.] Arch. Zellforsch. **15**: 249–268. *1 pl.* 1920.—Author believes he has affected distribution of the unpaired sex ("X") chromosome by alterations in temperature and ripeness of eggs, thus influencing sex ratio. In overripe eggs X remained in egg (♂ producing) in 146 cases, went to polar body in 101 cases—ratio 101 ♀'s: 144♂'s. Eggs produced under same conditions (temperature 12–16°) but not overripe gave 61 ♀'s: 45♂'s — ratio 100 ♀'s: 74 ♂'s. Warmed eggs (30–37°) gave 52 ♀'s: 84 ♂'s—ratio 100 ♀'s: 162♂'s. Cooled eggs (3–8½°) gave 49 ♀'s: 32♂'s—ratio 100 ♀'s: 65♂'s. Totals in each experiment represent from 7 to 14 clutches of eggs, in most of which the deviation is in same direction as that of total. Ratios are based on about one-third of eggs studied; in others distribution of X could not be determined. Author believes that overripe and warmed eggs are "old," and that cold keeps eggs "young;" hence old eggs give excess of males, young eggs excess of females.—*C. W. Metz.*

1837. Seiler, J. [German rev. of: Nachtsheim, Hans. **Zytologische und experimentelle Untersuchungen über die Geschlechtsbestimmung bei Dinophilus apatris Korsch.** (Cyto-

logical and experimental studies on the sex determination of Dinophilus apatris Korsch.) Arch. Mikrosk. Anat. 93 (Sec. 2): 17–140. *4 pl., 5 fig.* Nov., 1919.] Zeitschr. Indukt. Abstamm. u. Vererb. 24: 290–291. Nov., 1920.

1838. Sirks, M. J. [Dutch rev. of: Rabaud, E. **Recherches sur l'hérédité et la variation. Étude expérimentale et théorie physiologique. (Studies on heredity and variation. Experimental study and physiological theory.)** Bull. Biol. France et Belgium. Suppl. 1. *313 p.* 1919.] Genetica 2: 471–475. Sept., 1920.

1839. Smith, Bertram G. **The individuality of the germ-nuclei during the cleavage of the egg of Cryptobranchus allegheniensis.** Michigan Acad. Sci. Ann. Rept. 21: 105–107. 1919.—A preliminary report of a detailed paper of the same title published in Biological Bulletin 37: 246–287. 1919.—The author finds that during the fertilization of the egg of *Cryptobranchus* (Urodele) the egg and sperm nuclei do not fuse. In the first cleavage mitosis each of these nuclei gives rise to a separate group of chromosomes whose descendants pass separately to daughter-nuclei. This duplexity persists, and "The genetic continuity of each half of the double nucleus has been clearly traced to an advanced cleavage stage."—*C. L. Parmenter.*

1840. Stuart, C. P. Cohen. **Die Züchtung der Teepflanze. [Breeding of the tea plant.]** Zeitschr. Pflanzenzücht. 7: 157–204. *8 fig.* June, 1920.—Brief discussion on species classification of various botanists is given. One species, *Camellia theifera* (Griffith) Dyer, is considered sufficient to cover all types. As in the case of species, confusion exists in the separation of varieties. Comparative study of varieties or sorts and biotypes is made, so that it is possible to recognize and select valuable kinds. Seeds of light weight were found to usually produce inferior plants. Selection of seed, varying from 13 to 19 mm. in diameter, showed no effect according to Bernard. Variation of a population in time of blooming, disease resistance, branching habit, type and sterility is given in a table. A careful statistical study was made of leaves of numerous races in regard to length, breadth, etc., and the results tabulated. Branching habit was separated into two types and other minor differentiating characters were mentioned. Physiological differences as resistance to diseases were thought to exist. Variation was found in content of caffein and tannin but differences in yield were difficult to measure. Partial correlation was found between leaf length and breadth and strong individual correlation between length of leaf and tip of leaf. Morphological-physiological relation apparently exists between leaf tip and tannin content, at least only races with a tip over 9 mm. contained more than 15 per cent tannin. Descriptions are given of floral structure and inflorescence. Four forms of sterility occur, namely, bud, bloom, fruit and seed.—*Richard Wellington.*

1841. Tischler, G. [German rev. of: Allen, C. E. **A chromosome difference correlated with sex difference in Sphaerocarpos.** Science 46: 466–467. 1917. Idem. **The basis of sex inheritance in Sphaerocarpos.** Proc. Amer. Phil. Soc. 58: 289–316. *28 fig.* 1919. (See Bot. Absts. 4, Entry 486.)] Zeitschr. Indukt. Abstamm. u. Vererb. 24: 182–183. Sept., 1920.

1842. Tischler, G. [German rev. of: Kuwada, Y. **Die Chromosomenzahl von Zea Mays L. Ein Beitrag zur Hypothese der Individualität der Chromosomen und zur Frage über die Herkunft von Zea Mays L. (The chromosome number of Zea Mays L. A contribution to the hypothesis of the individuality of chromosomes and to the problem of the origin of Zea Mays L.)** Jour. Coll. Sci. Imp. Univ. Tokyo 39^{10}: 1–148. *2 pl., 4 fig.* Aug., 1919. (See Bot. Absts. 4, Entry 643.)] Zeitschr. Indukt. Abstamm. u. Vererb. 24: 294–295. Nov., 1920.

1843. Tischler, G. [German rev. of: Rosenberg, Otto. **Chromosomenzahlen und Chromosomendimensionen in der Gattung Crepis. (Chromosome number and chromosome dimensions in the genus Crepis.)** Ark. Bot. 15^{11}: 1–16. *6 fig.* 1918. (See Bot. Absts. 3, Entry 284.)] Zeitschr. Indukt. Abstamm. u. Vererb. 24: 294. Nov., 1920.

1844. Tischler, G. [German rev. of: Sakamura, T. **Experimentelle Studien über die Zell- und Kernteilung mit besonderer Rücksicht auf Form, Grösse und Zahl der Chromosomen. (Experimental studies on cell and nuclear division with special reference to form, size, and number of the chromosomes.)** Jour. Coll. Sci. Imp. Univ. Tokyo 39^{11}: 1–221. *7 pl., 24 fig.* 1920.] Zeitschr. Indukt. Abstamm. u. Vererb. 24: 183–184. Sept., 1920.

1845. Tischler, G. [German rev. of: Schacke, Martha A. **A chromosome difference between the sexes of Sphaerocarpos texanus.** Science 49: 218–219. Feb. 28, 1919. (See Bot. Absts. 3, Entry 1034.)] Zeitschr. Indukt. Abstamm. u. Vererb. 24: 183. Sept., 1920.

1846. Tischler, G. [German rev. of: Winge, Ø. **On the relation between number of chromosomes and number of types, in Lathyrus especially.** Jour. Genetics 8: 133–138. *Pl. 5.* April, 1919. (See Bot. Absts. 3, Entry 306.)] Zeitschr. Indukt. Abstamm. u. Vererb. 24: 182. Sept., 1920.

1847. von Tschermak, E. **Steigerung der Ertragsfähigkeit der Tomaten durch Bastardierung in der ersten Generation. [Increase of productivity of tomatoes through hybridization in the first generation.]** Nachr. Deutsch. Landwirtschaftsges. f. Österreich 1918: 425–426. 1918.—Author recalls work of Shull and of East and Hayes on maize wherein poor strains secured by inbreeding gave rise on crossing to good F_1 plants. Points out also similar valuable results in case of F_1 in some domestic animals. Brief report then given of results on four varieties of tomatoes. Most fully investigated were Cooper's First Crop and Ficarazzi, the former of which yielded per plant an average of 3.6 kgm., the latter 3.0 kgm. The F_1 hybrids of these two varieties yielded over 5.1 kgm. per plant (based on 16 plants). Because of ease of securing hybrid seed author deems its production for commerce as worth considering. —*James P. Kelly.*

1848. Urban, J. **Die Grösse der Rübenknäuel und der Rübenertrag. [Size of the beet seedballs and yields of beets.]** Zeitschr. Zuckerind. Cechoslovak. 44: 151–155. 1920.—See Bot. Absts. 7, Entry 1714.

1849. Vernet, G. **Biométrie et homogénéité. [Biometry and homogeneity.]** Bull. Agric. Inst. Sci. Saigon 2: 15–26. 1920.—The author discusses some of the precautions necessary in interpreting distribution curves. He considers it impossible to determine the components of a bimodal or other composite curve. He suggests that the representation of distribution curves be standardized as to number of individuals, scale of ordinates and abscissas to be used in each variety of plant or animal.—*Sewall Wright.*

1850. Walther-Giessen. [German rev. of: Kuiper, K., Jr. **Onderzoekingen over kleur en teekening bij runderen. Naar experimenten van R. Houwink Hzn. (Researches on color and markings in cattle. Based on experiments by R. Houwink Hzn.)** Genetica 2: 137–161. *5 pl.* Mar., 1920. (See Bot. Absts. 6, Entry 1096.)] Zeitschr. Indukt. Abstamm. u. Vererb. 24: 292–293. Nov., 1920.

1851. Walther-Giessen. [German rev. of: Little, C. C. **A note on the human sex ratio.** Proc. Nation. Acad. Sci. [U. S.] 6: 250–253. *1 fig.* May, 1920.] Zeitschr. Indukt. Abstamm. u. Vererb. 24: 296. Nov., 1920.

1852. Wilder, Harris Hawthorne. **Physical correspondences in two sets of duplicate twins.** Jour. Heredity 10: 410–420. *Fig. 15–19.* Dec., 1919.—The author points out that there is a comparable degree of similarity of palmae and plantar ridges between duplicate twins as between the rows of scales of the carapace of a single litter of armadillos. Since Newman and Patterson have shown that the armadillo is polyembryonic, we may assume that duplicate twins are polyembryonic. After discussing briefly the palm and sole prints of duplicate and fraternal twins, the author presents the measurements and prints of two sets of duplicate twins which show remarkable similarity between the individuals of a twin group and the lateral symmetry of a single individual.—*J. H. Beaumont.*

1853. Woltereck, Rich. **Variation und Artbildung. Analytische und experimentelle Untersuchungen an pelagischen Daphniden und anderen Cladoceren. Erster Teil: Morphologische, entwicklungsgeschichtliche und physiologische Variations-Analyse.** [Variation and species formation. Analytical and experimental studies on pelagic Daphnias and other Cladocera. Part I. Analysis of morphological, embryological, and physiological variation.] *145 p., 6 pl., 55 fig.* Bern, 1919.—See Bot. Absts. 7, Entry 1791.

1854. Zaleski, Leopold. **Wkwestyi metod analityernych w selekcjii buraków pastewnych.** [Contribution to the analytical method in fodder-beet breeding.] Ziemianin Posen, 1920.—See Bot. Absts. 7, Entry 1717.

HORTICULTURE

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FLORICULTURE AND ORNAMENTAL HORTICULTURE

1855. Albert, C. **Questions potagères d'actualité.** [Gardening questions appropriate to the season.] Rev. Hort. 92: 143–144. 1920.

1856. Allwood, Montague C. **Carnations—their pests and diseases.** Jour. Roy. Hort. Soc. 45: 233–235. *Fig. 35–38.* 1919.—The two main factors in having healthy carnations are initial clean stock and a correct fertilizer; the latter should be a slow acting organic food. An excess of nitrogen is detrimental. Stem rot is perhaps the most common disease; it can be prevented, but not cured, by proper soil conditions. Bacteriosis or stigmonose may be prevented by propagating from vigorous, healthy plants. Red spider (*Tetranyclus telarius*) may be controlled by daily syringing and by the use every fourteen days of specially prepared nicotine extract. Split calyx is caused by irregular soil or climatic conditions, or by the use of unsuitable fertilizers. Various soil pests are controlled by steam sterilization or by allowing chickens access to the soil before it is brought into the greenhouse.—*J. K. Shaw.*

1857. Anonymous. **Articles of agreement between the American Iris Society and the Brooklyn Botanic Garden.** Brooklyn Bot. Gard. Rec. 9: 119–121. 1920.—"The essence of this agreement is the development, maintenance, and study of a beautiful, complete, and valuable collection of Japanese irises, and the utilization of it in such a manner as to promote the aims and objects of the Society and the Garden jointly."—*C. S. Gager.*

1858. Barron, Leonard. **The feast of the dahlias.** Gard. Mag. 32²: 128–131. *9 fig.* 1920.—A discussion regarding exhibits of the American Dahlia Society.—*H. C. Thompson.*

1859. Barron, Leonard. **Our own evergreen garden.** Gard. Mag. 32²: 133–134. *1 fig.* 1920.—Uses of evergreens in decorative planting, with a large list of coniferous and broad-leaved species.—*H. C. Thompson.*

1860. Bixby, W. G. **Cordiformis-sieboldiana.** Amer. Nut. Jour. 11: 56. 1919.—*Juglans cordiformis* is not a species distinct from *Juglans sieboldiana.* E. H. Wilson of the Arnold Arboretum confirms this statement.—*E. L. Overholser.*

1861. Boyer, Jacques. **Artificial fertilization of flowers.** Sci. Amer. 122: 651. *3 fig.* 1920.

1862. Chasset, L. **Dans les petits jardins: le gobelet nain.** [The dwarf goblet in small gardens.] Rev. Hort. 92: 183–184. *Fig. 64.* 1920.—Specific directions for the complete development of the goblet form of dwarf tree from the single-stem graft of one year of age are given, since well formed trees are generally not available from the nurseries. This form possesses the following advantages: All the main branches are of equal height; the tree and fruits receive

a maximum of light and air and are more easily cared for; the entire length of all of the branches is net bearing area, with no space unproductive.—*E. J. Kraus.*

1863. Cochet-Cochet. **Deux roses nouvelles.** [Two new roses.] Rev. Hort. 92: 142. *1 pl. (colored).* 1920.—The variety Mervouw Dora van Tets is a brilliant scarlet hybrid tea, seedling of General MacArthur × Farbenkönigen, introduced by Leenders and Co. in 1912. The variety Duchess of Sutherland is a delicate rose pink hybrid tea, seedling of an unnamed variety, introduced by Alex. Dickson and Son in 1912. Both possess good foliage and vigor.—*E. J. Kraus.*

1864. Gibson, Henry. **Forcing shrubs into winter bloom.** Gard. Mag. 32[1]: 11–13. *4 fig.* 1920.—Discusses methods of forcing various flowering shrubs into bloom in the greenhouse.—*H. C. Thompson.*

1865. Harshberger, John W. **The old gardens of Pennsylvania I—Bartram Arboretum and Park.** Gard. Mag. 32[2]: 78–80. *6 fig.* 1920.

1866. McFarland, J. Horace. **A visit to the rose factory.** Gard. Mag. 31[6]: 373–374. *2 fig.* 1920.—The writer tells of a visit to Dr. Walter Van Fleet's rose garden at Bell Station, Maryland, and describes some of Van Fleet's productions.—*H. C. Thompson.*

1867. McFarland, J. Horace. **Walks and talks at Breeze Hill—II. Wherein is reflective, critical, philosophical and friendly comment.** Gard. Mag. 32[2]: 95–97. *5 fig.* 1920.—A discussion of several little grown and rare flowers.—*H. C. Thompson.*

1868. Miller, William Tyler. **Shrubs and vines for California gardens.** Gard. Mag. 32[4]: 191–193. 1920.—The writer gives a system of choosing the kinds of plants best adapted to soil, climatic and other conditions and lists the plants under the following headings: shrubs that blend with the native landscape; shrubs for protected sunny situations (tender); shrubs for full shade; shrubs for partial shade; shrubs that bloom a long time; shrubs with fragrant leaves or flowers; shrubs attractive in both flower and fruit; shrubs for the interior; deciduous shrubs; shrubs for seaside (wind resisters); bush roses; vines to screen unsightly objects; vines for decorating fine architecture; vines for brick, stone, stucco; vines for decorative effect; vines for shady places; vines for heavy soil (drought resisters). Under each of these headings are listed the names of the plants recommended.—*H. C. Thompson.*

1869. Mitchell, Sidney B. **The whole year round in the California garden.** Gard. Mag. 32[4]: 180–186. *4 fig.* 1920.—A calendar of operations and lists of plants under the following headings; trees, shrubs, and climbers; spring flowering trees and shrubs; a sequence of bulbs; summer bulbs; rock gardens and walls; perennials, biennials, and annuals for border planting.—*H. C. Thompson.*

1870. Pendleton, Isabella. **Striking perennial combinations.** Gard. Mag. 32[2]: 81–82. *4 fig.* 1920.—A short discussion of various combinations using perennial herbaceous plants, also giving a chart suggesting plants to use together with date of bloom for each, color of blossoms, etc.—*H. C. Thompson.*

1871. Rea, John L. **A garden beside the Adirondacks.** Gard. Mag. 32[2]: 88–91. *5 fig.* 1920.

1872. Rivoire, P. **Sachons orner de fleurs nos maisons.** [Let us know how to decorate our homes with flowers.] Rev. Hort. 92: 138–139. 1920.—Discussion of the methods and materials for the making of bouquets, also the selection of bedding plants and decorative shrubs.—*E. J. Kraus.*

1873. Saunders, A. P. **What America has done for the peony.** Gard. Mag. 32[1]: 29–33. *10 fig.* 1920.—A historical sketch of peony development, with a discussion of the part played by pioneer and modern workers in the improvement of this flower.—*H. C. Thompson.*

1874. Sessions, Kate O. **Color planting for Pacific coast gardens.** Gard. Mag. 32[4]: 205–208. *7 fig.* 1920.—Recommends plants, trees, shrubs, and herbaceous plants for various color effects for several types of plantings under different conditions.—*H. C. Thompson.*

1875. Shamel, A. D. **A bud variation of the Le Grande Manitou dahlia.** Jour. Heredity 10: 367–368. *10 fig.* 1919.

1876. Sturtevant, Robert A. **The decorative element in the foliage of iris.** Gard. Mag. 32[3]: 103–104. *2 fig.* 1920.

1877. Sturtevant, Robert S. **Irises from Japan.** Brooklyn Bot. Gard. Rec. 9: 115–119. 1920.—Treats briefly of the various species, the present confusion in nomenclature, and the agreement recently entered into between the American Iris Society and the Brooklyn Botanic Garden to coöperate in the establishment at the latter place of test and show gardens, with the view of straightening out this confusion. [See also Bot. Absts. 7, Entry 1857.]—*C. S. Gager.*

1878. Taylor, Norman. **Effects of the winter of 1919–1920 on the woody plants in the garden.** Brooklyn Bot. Gard. Rec. 9: 121–123. 1920.—Gives list of species killed outright, species severely winter-killed but recovering, and species slightly winter-killed.—*C. Stuart Gager.*

1879. Theiss, Lewis and Mary. **Ferns for the garden.** Gard. Mag. 32[1]: 16–19. *7 fig.* 1920.—Discusses various kinds of ferns for different uses.—*H. C. Thompson.*

1880. Van Fleet, Walter. **Raising new roses from seed.** Gard. Mag. 31[6]: 370–373. *6 fig.* 1920.—Discusses stage of ripeness at which seed should be gathered. Writer favors gathering when fruits are well colored, but still firm. Gives methods of stratifying seeds, methods of planting, soil, etc., and describes methods that have been tried to hasten germination, but favors action of frost and solvent action of snow water. The writer points out the difficulties in growing rose plants from seeds and gives advice regarding the care of the seedling plants of the various kinds of roses.—*H. C. Thompson.*

1881. Weston, J. G. **Some Irish gardens.** Jour. Roy. Hort. Soc. 45: 247–256. 1919.

1882. Wilson, E. H. **The romance of our trees. XI. Trees of columnar growth.** Gard. Mag. 31[6]: 381–384. *5 fig.* 1920.—Describes various species and varieties of trees which have an upright habit of growth, especially upright branched forms of some of the common species of maple, tulip, oak, elm, linden, beech, poplar, and various conifers.—*H. C. Thompson.*

1883. Wilson, E. H. **The romance of our trees. XII. The pigmies and dwarfs.** Gard. Mag. 32[1]: 36–40. *9 fig.* 1920.—Descriptions of dwarf forms of several species of evergreen trees and of a few deciduous species, together with their uses.—*H. C. Thompson.*

1884. Woodman, A. M. **Acacia accessions from Australia.** Gard. Mag. 32[4]: 200–202. *7 fig.* 1920.—Brief descriptions of several species grown in California and in greenhouses in other parts of the United States; special uses mentioned for some species.—*H. C. Thompson.*

FRUITS AND GENERAL HORTICULTURE

1885. Anonymous. **History of named varieties of pecans.** Amer. Nut Jour. 10: 87. 1919.

1886. Anonymous. **New hybrid fruit plants.** Nation. Nurseryman 28[12]: 290. 1920.—A hybrid between the black currant and gooseberry is reported from Knockando, Speyside, Scotland.—*J. H. Gourley.*

1887. Anonymous. [Palmer, E. F.] **Report of the Ontario Horticultural Experiment Station, Vineland Station, Ontario.** 1918: 1–40. 1919.—A progress report of experimental and breeding work in horticulture.—*E. F. Palmer.*

1888. Anonymous. **Blooming and ripening season of various fruits.** Rept. Hort. Exp. Sta. Vineland Sta., Ontario 1918: 24–26. 1919.—A summary of the blooming and ripening dates of commercial varieties of apples, apricots, cherries, peaches, pears, plums and grapes. The dates given cover generally a period of from three to five years' observations.—*E. F. Palmer.*

1889. Anonymous. **Raspberry breeding.** Rept. Hort. Exp. Sta. Vineland Sta., Ontario 1918: 14. *4 fig.* 1919.—Seedlings of the wild forms of *Rubus occidentalis*, *R. strigosis*, and hybrids of these species and of cultivated varieties have been fruited and described. Seedlings of *R. occidentalis* came practically true from seed and as a whole were nearly equal to the cultivated variety Gregg. *R. strigosus* seedlings also came true from seed. Hybrids of *R. occidentalis* (wild black) × *R. strigosus* (wild red) indicated a compromise in growth and foliage characters. The fruit was all of the purple cane type.—In a reciprocal cross of these species, plants and fruit all closely resembled the *R. strigosus* parent.—From a cross of Gregg (black) × Cuthbert (red) 152 plants were fruited and bore fruit in the approximate ratio of 1 red to 4 black to 16 purple cane. The reciprocal cross gave all red raspberries.—*E. F. Palmer.*

1890. Anonymous. **Self-fertility tests of varieties of pears.** Rept. Hort. Exp. Sta. Vineland Sta., Ontario 1918: 29. 1919.

1891. Aubin, M. L. **L'Incision Annulaire du Pêcher. [Ringing of the peach tree.]** Jour. Soc. Nation. Hort. France 21: 268–269. 1920.—Gives results of ringing branches of the peach trees to show advantages on earliness, size, and increased yield due to ringing.—*H. C. Thompson.*

1892. Ballou, F. H., and I. P. Lewis. **Orchard rejuvenation in southeastern Ohio. (Second Report.)** Ohio Agric. Exp. Sta. Bull. 339. *42 p.* 1920.—On thin, poor, upland soils a quickly available supply of nitrogen was found to be essential. Phosphorus was beneficial but potash gave poor returns. Annual applications of 5 pounds per tree per year each of nitrate of soda and acid phosphate used in connection with straw mulch gave practically the same results as 10 pounds of each fertilizer not used in connection with a straw mulch. Animal sources of nitrogen and phosphorus (tankage and bone) were found to be much less satisfactory because they act too slowly where quick results are desired. Orchard rejuvenation in southeastern Ohio has been proved to be highly profitable commercially.—*R. C. Thomas.*

1893. Bixby, W. G. **The butternut and the Japan walnut.** Amer. Nut. Jour. 10: 76–79. 1919.—There are three groups of walnuts: (1) butternut group; (2) black walnut group; and (3) Persian walnut. It is hardly possible that *Juglans cordiformis* and *J. sieboldiana*, both belonging to group (1), are hybrid between *J. cathayensis*, group (2) ,and *J. regia* var. *sinensis*, group (3), because nuts show no suggestions of peculiar interior shell structure of group (3) or (2); hence hypothesis advanced to that effect is disproved. The rough shelled Japan walnut may be due to black walnut pollen. There is possibility of developing a nut with the fine flavor of butternut and the smooth thin shell of Japan walnut, and having a long northern and southern range.—*E. L. Overholser.*

1894. Bixby, W. G. **The 1918 nut contest.** Amer. Nut. Jour. 11: 72–74. 1919.—Author tabulates new score-card. Six of the characteristics can be quantitatively measured. The cracking quality is the ratio of the weight of the kernel easily extracted to the total weight and is expressed in per cent.—*E. L. Overholser.*

1895. Bixby, W. G. **Nuts without inner shell.** Amer. Nut Jour. 11: 37. 1919.—Author finds nuts without inner shell partition are not entirely unknown even with species which

normally have them. The propagation of these abnormal nuts should be attempted.—*E. L. Overholser.*

1896. Bonnet, L. O. **The "Yema" graft of the vine.** Monthly Bull. Dept. Agric. California 8: 505–508. 1919.—"Yema" budding is a new method of field grafting used in Australia with great success. It is really a process of grafting and not budding, for the eye used as a scion carries a good portion of wood with it. It differs from ordinary grafting by great reduction of size of scion and the time at which it is practised,—the latter part of August and during September. The graft is performed on nearly mature wood. The scion is covered up after graft is made. The percentage of perfect unions obtained is main advantage of "Yema" graft.—*E. L. Overholser.*

1897. Bullard, W. P. **Cultivated pecans are produced now in carload lots.** Amer. Nut Jour. 11: 32. 1919.—The plan of collective and brand marketing has been endorsed by growers, consumers and brokers. It is the only scientific method of selling that will eliminate competition between the several varieties and that will harmonize the different sections of the country.—*E. L. Overholser.*

1898. Bunyard, E. A. **Cobnuts and filberts.** Jour. Roy. Hort. Soc. 45: 224–232. *Fig. 27–34.* 1919.—This is a discussion of the history and culture of various types of *Corylus avellana.* The term cob is applied to the short round nuts not covered by a husk and the term filbert to the long nuts quite covered with a husk. These nuts are growing in Kent but there is no reason why they may not be grown in other parts of England as well. Plants are found growing on various soils. Methods of propagation and culture are discussed and a short account of several injurious insects is given. Description of 12 named horticultural varieties is appended.—*J. K. Shaw.*

1899. Burns, W., and P. G. Dani. **Some facts and figures regarding banana cultivation.** Agric. Jour. India 15: 386–392. 1920.—A report showing cost of operation and income from a small banana plot which was run for 3½ years.—*F. M. Schertz.*

1900. Chasset, L. **A propos de la Pêche "Amsden."** [**The Amsden peach.**] Rev. Hort. 92: 144–145. 1920.—Much of the criticism of this American variety is due to the fact that insufficient care was used in selecting the buds and grafts from which to propagate. It is known that there is a possibility of an enormous difference between the individuals arising from the buds variously placed on a tree or on a branch. It is possible to tell whether a variety is good or poor only after grafts have been changed from the region where it is favorably regarded to those in which it is criticized. Amsden is really one of the best varieties of its season and bears well in many parts of France, thousands of trees being grown out of doors. —*E. J. Kraus.*

1901. Corbett, L. C. **Cooperation in and coordination of investigational work in horticulture.** Proc. Amer. Soc. Hort. Sci. 16: 145–149. (1919) 1920.—Attention is drawn to the fact that there are so many and varied problems in horticulture needing solution that the investigators in the states and federal department could well afford to cooperate in working them out.—It would help if the different investigators working on the same problem would take uniform data and records, so that the various results could be more easily compared and the effects of certain treatments studied. It would be well if certain projects were duplicated in several parts of the country under different conditions.—In order to study the fundamental problems, it is suggested that well trained horticulturists, plant physiologists, chemists, etc., cooperate in their investigational work.—*E. C. Auchter.*

1902. Dani, P. G. **The orientation of the banana inflorescence.** Agric. Jour. India 15: 461–462. 1920.—Evidence is submitted which tends to show that the inflorescence appears on the side opposite the cut surface from which it springs.—*F. M. Schertz.*

1903. Darrow, Geo. M. **Are our raspberries derived from American or European species?** Jour. Heredity 11: 179–184. *Fig. 17–20.* 1920.—A classification as to species and species crosses of the varieties of raspberries grown in the U. S. A. Classification was made from herbarium material supplemented by field observation and from the history of the variety. Many doubtful cases must be checked up by the plant breeder. A review of material of value to the fruit breeder.—*J. H. Beaumont.*

1904. Deming, W. C. **Why not develop walnuts, hickory nuts, filberts, butternuts, and chestnuts?** Amer. Nut Jour. 11: 23. 1919.

1905. Drieberg, C. **A freak pawpaw (Carica Papaya).** Jour. Heredity 10: 207. 1919.—Trees found in Ceylon bearing sulphur yellow fruits, the smaller fruits being almost white. Seeds in part bred true, in part gave rise to trees bearing the ordinary green fruits.—*J. R. Schramm.*

1906. Edwards, C. L. **Lessons of the season.** Amer. Nut Jour. 11: 94. 1919.—Emphasizes proper drainage for pecan trees.—*E. L. Overholser.*

1907. Edwards, C. L. **Official report on nut growing in Texas.** Amer. Nut Jour. 11: 95, 97. 1919.

1908. Fletcher, S. W. **Observation on French horticulture.** Proc. Amer. Soc. Hort. Sci. 16: 136–140. (1919) 1920.—Information is given concerning the amount and character of horticulture in France. As compared to America's extensive plantings and commercial orchards, fruit and vegetable growing is more intensive in France. Likewise there is a much keener interest in amateur horticulture. More dwarf trees are used and they are very carefully trained into various shapes and patterns.—*E. C. Auchter.*

1909. Gallard, L. **Strawberry culture around Sydney.** Agric. Gaz. New South Wales 31: 731–737, 815–820. *10 fig.* 1920.—Popular description of methods is given, including method and time of planting, varieties, mulching, treatment of runners, harvesting and irrigation, along with other details.—*L. R. Waldron.*

1910. Galloway, Beverly T. **Some promising new pear stocks.** Jour. Heredity 11: 25–32. *Fig. 10–17.* 1920.—About five million pear trees must be grown each year to meet the losses caused by fire-blight and normal orchard increase. The Office of Foreign Seed and Plant Introduction, U. S. A., has introduced a large number of pears and during the last few years has given considerable attention to testing them for stock breeding purposes and for fruit. The office highly recommends the Chinese Calleryana pear as the most rapid growing, most easily budded, and most resistant of any stock. Several others of these Chinese importations are much superior to the French stock that is now used.—*J. H. Beaumont.*

1911. Guillaumin, A. **Citranges, limonanges, satsumanges.** Rev. Hort. 92: 140–142. *Fig. 50–51.* 1920.—Hybrids between *Citrus trifoliata* and the various subspecies of *Citrus Aurantium*, known as citranges, have been secured by Trabut in Algiers, Bernard at Montauban, and Webber and Swingle in Florida. Among these the two varieties Armand Bernard and Rusk are best known. A second lot of seedlings was obtained by Bernard by crossing several varieties of oranges with *C. trifoliata.* These are distinct from the other type of citrange and are designated as Citrange de Montauban amelioré. The fruits of at least two forms are edible. (To be continued.)—*E. J. Kraus.*

1912. Hatton, Ronald G. **A first report on quince stocks for pears.** Jour. Roy. Hort. Soc. 45: 269–277. *Fig. 62–66.* 1919.—Beginning in 1914 a collection of quince stocks used for pear propagation has been acquired from various English and foreign nurserymen at the Wye College Fruit Experiment Station. Out of this collection five chief groups or types have been distinguished and their botanical and horticultural character described and illustrated. Their probable identifications are A. d'Angers, B. Common, C. Unknown, D. de Fontenay and

E. Portugal. Further study may reveal additional types. Propagation has been by both layers and cuttings and the various types root with varying degrees of success. The value of these several types for different varieties of pears will now be tested.—*J. K. Shaw.*

1913. Hatton, Ronald G. **Suggestions for the right selection of apple stocks.** Jour. Roy. Hort. Soc. **45**: 257–268. *Fig. 46–61.* 1919.—In the popular mind there are three types of stocks: (1) paradise or dwarfing stocks for bush trees only; (2) free growing stocks for standard trees; and (3) crab stock from tips or suckers of the "true wild crab" for the same purpose as (2). Investigation shows that there are eight or nine types of paradise in general use, varying in vigor from those from free stocks to those forcing vigorous varieties into bearing the second year. No correlation was found between the vigor of growth and the type of root system; the same proved to be true of free and crab stocks. Many of the free stocks showed root knots and exhibited the possibility of easy vegetative propagation. Although strong growing varieties may largely obliterate the inequalities in stocks, differences again become apparent in the second and third year. It was found possible to raise stocks of deep anchorage by layers and other vegetative methods.—*J. K. Shaw.*

1914. Hooker, Henry D. **Methods of approach to horticultural problems.** Proc. Amer. Soc. Hort. Sci. **16**: 140–145. (1919) 1920.—Attention is drawn to the fact that there is wide diversity of opinion among leading horticulturists of the country on many of the fundamental questions of orchard management. Several examples, notably bud selection, orchard pruning, and orchard fertilization, are cited. The author states, "with these experiments, the knowledge of the fundamental changes within the plant is wanting and it is only by means of this knowledge that we can judge the value of the effects procured. It is only by paying attention to the changes going on inside of the organism and by obtaining exact information of what these changes are, that uniformity of conclusions must result." It is suggested that in attacking problems of nutrition and physiological regulation of fruit trees, a diagnosis should first be made and then the effects of various treatments determined. Finally, application to specific cases is possible with the above knowledge.—The value of the work of Kraus and Kraybill in this direction is pointed out. It is suggested that in the case of fruits, analysis of fruit spurs and buds could be made in order to secure an exact indication of the prevailing physiological conditions. The effects of various treatments on the chemical composition of the plant should then be determined. With this information, the author says, "Eventually it should be possible to analyze a few fruit spurs from a tree and to know immediately wherein the physiological condition of that tree is abnormal with respect to maximum productiv ty and to know what treatments will correct the abnormality."—*E. C. Auchter.*

1915. Howard, W. L. **Progress report on rootstock experiment.** Monthly Bull. California State Commission Hort. **8**: 13–14. 1919.—The following results were obtained with varieties and stocks from one to four years of age: Bartlett on quince stocks are failing rapidly, whereas those on Japanese and French stocks show healthy growth; Royal Ann thrives equally well on Mazzard and Mahaleb, as does the almond on Myrobalan, peach, and almond stocks; a Royal apricot and Burbank plum thrive best on peach stock. Asphaltum used on trees as a protection against rabbits or borers has no injurious effect on the bark.—*E. L. Overholser.*

1916. Howard, W. L. **What root stocks are we using?** Nation. Nurseryman **28**[12]: 288–290. 1920.—A survey showing the percentage of root stocks in use for the various deciduous fruits of California three years ago, and the changes which occurred during that period. Recommendations are made in regard to the best usage.—*J. H. Gourley.*

1917. Jackson, V. G. **Cultivation of the vine in America.** [Rev. of: Hedrick, U. P. **Manual of American grape-growing.** *xiii + 45*[illegible] *p., 32 pl.* Macmillan Co.: New York and London, 1919.] Nature **105**: 674. 1920.

1918. Jones, J. F. **The heart-nut.** Amer. Nut Jour. **10**: 36. 1919.—Heart-nut, *Juglans cordiformis*, is a "sport" or variation from *J. Sieboldiana*, the common Japan walnut It is a very regular and prolific bearer, the nuts being heart-shaped, smooth, brown in color, and of excellent quality. The author advises its propagation.—*E. L. Overholser.*

1919. Kegley, H. C. **A promising new Persian walnut.** Amer. Nut Jour. **10**: 54. 1919.—The Ehrhardt is a variety which may be expected to bear 25 to 50 per cent heavier than any other known variety. It is resistant to blight and has a tendency to bear early. It will prove most satisfactory and profitable in Southern California.—*E. L. Overholser.*

1920. Kruckeberg, Henry W. **A half million dollar nursery industry.** Amer. Nurseryman 32^6: 119–120. 1920.—Statistics are given on the nursery and fruit business of California and estimates are made of the increase over the last census. It is stated that the nurserymen of California have made a serious and consistent effort to produce high grade stock, free from pests, and to select varieties adapted to the special sections.—An account is also given of the development of the California Nurserymen's Bud Selection Association.—*J. H. Gourley.*

1921. Linton, W. S. **A great step in advance for nut culture.** Amer. Nut Jour. **10**: 67. 1919.—Through the agency of Senator H. A. Penny the Michigan legislature passed a bill providing for extensive planting of nut bearing or other food producing trees along the highways of the State of Michigan, and the maintenance, protection and care of such trees.—*E. L. Overholser.*

1922. Linton, W. S. **Nut trees for highways and public places.** Amer. Nut Jour. **11**: 87. 1919.—The author recommends maple tree, black walnut (*Juglans nigra*) and butternut (*Juglans cinerea*), and also the white oak (*Quercus alba*) and the bur oak (*Quercus macrocarpa*).—*E. L. Overholser.*

1923. McCrae, Lee. **Foreign fruits at home on our west coast.** Gard. Mag. **32**: 203–204. *2 fig.* 1920.—At least thirty kinds of introduced fruits, besides olives, apricots, and the citrus varieties, are grown in Orange County, California. The conditions under which the various fruits thrive are given, especially the requirements for mango, sapote, cherimoya, date, papaya, avocado, and nutmeg. Other fruits mentioned are: St. John's bread or carob, feijoas, pomegranates, persimmons, jujubes, varnish nuts, camphor, loquats, kumquat, chaotes, citron, and guava.—*H. C. Thompson.*

1924. Mawbray, Wallace. **Vanilla beans.** Practical Druggist 38^{11}: 61–62. 1920. [Taken from Nation. Bottlers Gaz.]—An account of the discovery, history, habitat, growth, curing, and assorting of vanilla "beans," *Vanilla planifolia.*—*Wm. B. Day.*

1925. Nomblot, A., et 'F. L.' **La protection des nouveautés horticoles. [The protection of horticultural novelties.]** Rev. Hort. **92**: 148–149. 1920.—Somewhat detailed suggestions regarding means and methods for securing just consideration and recognition of new varieties as well as protecting them against false exploitation.—*E. J. Kraus.*

1926. Patterson, J. M. **Report of committee on markets and marketing.** Amer. Nut Jour. **11**: 75–78. 1919.

1927. Pearcy, K. **Fourth general meeting of the Western Walnut Growers' Assn.** Amer. Nut Jour. **10**: 32–33, 42. 1919.—Newly planted walnut tree should be cut off at about 30 inches and the next spring the shoot should be cut off at the height desired for the head—4½–6 feet.—The filbert mite was introduced from Italy on filbert stocks. Injury consists in galling the leaf and fruit buds and the catkins. It is satisfactorily controlled by application of lime-sulfur spray (1:12) as early as the female blossoms are dried up. Possibly the aphis transports walnut blight bacteria (Prof. Lovett).—*E. L. Overholser.*

1928. Perry, A. S. **Pruning pecans in the Albany district.** Amer. Nut Jour. **13**: 22. 1920.—By far the majority of growers prefer the medium height system, which brings all the advantages of the low and high headed systems and has none of their disadvantages. Amount of shade on ground and cultivation facilities are the main considerations.—*E. L. Overholser.*

1929. Pickering, Spencer U. [Annual report.] Rept. Woburn Exp. Fruit Farm 17: 1–87. *3 fig.* 1920.—[Some copies of this report contain an appendix on Flocculation reprinted from Proc. Roy. Soc. London A, 94: 315–325. 1918.]—(1) *Action of grass on trees.* In pot experiments the injurious effect of grass grown above the roots is the same whether the grass is grown in sand or in loam and is independent of the thoroughness with which the grass roots intermingle with or are separated from the roots of the trees. This is what would be expected if the injurious effect is due to a soluble toxin produced during the growth of the grass rather than an effect of competition for water and nutrients. Striking effects were obtained by grassing over portions of orchards which had been under tillage; the crop was reduced by 5 per cent the first season and by 50–90 per cent the second; recovery did not follow even a year after the grass was removed. (2) *Experiments with soft-wooded plants.* The experimental plants were grown in pots and subjected to the action of surface growth consisting of grass and numerous other plants grown in an annular, perforated tray resting on the soil in the pot. A deleterious effect of one crop on another is a general action applying to all plants alike, though there may be differences in the extent to which different plants are effected or capable of injuring others. The nature of the toxin is unknown but it is easily oxidizable and may then serve as plant food; as a result of this, soft-wooded plants may make some recovery from the toxic action of other plants grown above their roots, but hard-wooded plants are rapidly, and apparently permanently, stunted. The toxic effect is not due to carbon dioxide produced in the soil by the surface growth and can not be counteracted by lime or by cresylic acid. The deleterious effect is reciprocal and trees were found to retard the growth of grass and crops planted beneath them in a manner independent of water and nutrient competition and shading effects. (3) *Behavior of plants in masses.* Plants were grown in rectangular pots, some undivided and others divided into six compartments to prevent root interference. Where the mass of soil is below a certain limit, the amount of plant growth is independent of the number of plants, i.e., the growth of individual plants is proportional to the area occupied by each *provided the plants are of the same age.* When plants of different ages are mingled, the older plants flourish at the expense of the younger ones and the total growth may be 20 per cent below the maximum possible when all the plants are of one age. A difference of 4 days in the age of mustard plants reduced the total crop by this amount. This effect is attributed to the toxic action of the older plants, the quantity of toxin produced being proportional to the amount and vigor of the growth. Interference of the above ground parts has very little effect on the amount of growth unless actual crowding occurs, since even great increase of the distance between plants does not result in an increase in growth greater than 15 per cent. The fact that border plants in field plots exceed the interior plants, is attributed to root interference within the plot, and more rapid oxidation of the toxins at the border. The inferiority of the interior plants can not be due to competition for food since the same effect is observed when the plots receive applications of fertilizers in excess of those which give beneficial returns. (4) *Drainage and toxicity.* An important effect of drainage is attributed to the removal of toxins produced in the soil by the surface growth.—*Freeman Weiss.*

1930. Quinn, Geo. **Notes on olive growing.** Jour. Dept. Agric. South Australia 23: 603–606. 1920.

1931. Reed, C. A. **Pecan grades and standards.** Amer. Nut Jour. 11: 69. 1919.—The importance of a definite table of grades is realized. The number of nuts per pound is not a safe criterion in establishing a grade. The author divides pecans into three groups each with two standards based on diameter measurements.—*E. L. Overholser.*

1932. Ringelmann, M. **Sur la resistance du vitrage des serres. [The resistance of greenhouse glass.]** Rev. Hort. 92: 146. 1920.—The resistance of ordinary double glass, and of cast striated glass of the same thickness is the same, as shown by an accompanying table. —*E. J. Kraus.*

1933. Sargent, C. S. **Forty-two distinct forms of hickories.** Amer. Nut Jour. 10: 20–21. 1919.

1934. Seymour, L. D. **Must we revise our pruning practices?** Gard. Mag. 32[1]: 27–28. *4 fig.* 1920.—A popular discussion of some results of pruning fruit trees based on work by W. H. Chandler of Cornell University.—*H. C. Thompson.*

1935. Shamel, A. D. **Origin of a grapefruit variety having pink colored fruits.** Jour. Heredity 11: 157–159. *Fig. 5–8.* 1920.—An account of the origin of two bud sports of grapefruit having pink colored flesh, one introduced by Reasoner Brothers of Oneco, Florida, as a sport of Walters, the other as a sport of Marsh in California.—*J. H. Beaumont.*

1936. Shamel, A. D. **Origin of a new and improved French prune variety.** Jour. Heredity 10: 339–343. *Frontispiece, fig. 1–3.* 1919.—A bud sport of the French prune (*Prunus domestica*) propagated in California and bearing fruits about twice the size of those of the parent variety.—*J. R. Schramm.*

1937. Taylor, R. H., and E. L. Overholser. **Some effects of high temperature and humidity upon the keeping quality of Bartlett pears.** Monthly Bull. California State Commission Hort. 8: 118–125. 1919.—When contrasted with temperatures between 70° and 85° F., temperatures of 87.7 to 110° F. caused an appreciable delay in the ripening. The retardation of ripening is directly proportional to temperature between the limits of 87 and 104° F. Above 110° F. rapid physiological breakdown results. Relative humidity does not seem to be a significant factor in checking the ripening process. The flavor of pears subjected to temperatures higher than 85° F. was not normal, being sweetish and slightly acid, juiciness was lacking. The effects of high temperatures are believed to be due to the different rates of enzymatic action at the different temperatures, a reduction of enzymatic action at the extremely high and low temperatures retarding the ripening of the pears.—*E. L. Overholser.*

1938. Tufts, W. P. **Influence of heavy and light pruning upon the growth of deciduous fruit trees.** Monthly Bull. Dept. Agric. California 8: 529–535. 1919.—Heavy cutting back does not, as was originally supposed, result in renewed and vigorous root development. After heavy pruning the energies of the tree are directed toward replacing the lost foliage area, resulting in lessened fruit production. The author's experimental results agree with those of Pickering (Woburn), and Alderman and Auchter (West Virginia), in that by light pruning large and strong trees are most quickly secured, and that it is at the same time conducive to precocious and prolific fruit production.—*E. L. Overholser.*

1939. Tufts, W. P. **Why prune bearing apricot trees heavily?** Monthly Bull. California State Commission Hort. 8: 15–21. 1919.—The so-called "Winters system" of apricot pruning has two very serious objections: (1) The upper side of the scaffold branches is very subject to sunburn; and (2) the heavy annual pruning is repressive in its effect. On the other hand, in the "long-pruning" system, abundant vegetative growth is produced to shield the branches, and the crop is borne both on spurs and on young shoots. To reduce wood growth and increase fruitfulness in vigorously growing trees the author knows of no better method than a dormant thinning-out process not accompanied by heading.—*E. L. Overholser.*

1940. Whirton, T. W. **A trip through the almond section of Spain.** Amer. Nut Jour. 10: 50–51. 1919.—Spain, including her Mediterranean Islands, produces 25 per cent of the world's annual output of almonds,—approximately 80,000 tons. Her mainland almonds are cultivated more or less in all the territory bordering on the Mediterranean from Catalonia to Andalusia and extending some distance into the interior. They are extensively cultivated also on the Balearic Islands, where soil and climate are specially propitious for normal growth and profitable development.—*E. L. Overholser.*

1941. White, Anna. **Creating a new fruit.** Gard. Mag. 32[3]: 156–158. *3 fig.* 1920.—A discussion of the development of the blueberry together with brief directions for its culture. —*H. C. Thompson.*

1942. Whitten, J. C. **Efficiency management of California orchards.** Monthly Bull. California State Commission Hort. 8: 5–6. 1919.

1943. Whittle, A. H. **The possibilities of citrus culture in India.** Agric. Jour. India **15:** 444–450. 1920.—The author believes that citrus fruits may be advantageously raised.—*F. M. Schertz.*

1944. Wilkinson, J. F. **Top grafting northern pecan trees.** Amer. Nut Jour. **10:** 48–49. 1919.—Seedling pecan trees, though most of them produce nuts of very little value, are the foundation of very valuable nut trees in the future if topworked to the better varieties. The author advises using slip-bark grafting. All cut surfaces should be covered with a good coat of grafting wax which in turn is covered with cloth.—*E. L. Overholser.*

1945. Young, W. J. **Muscadine grapes: culture and varieties.** South Carolina Agric. Exp. Sta. Bull. 205. *48 p. Fig. 1–19.* 1920.—The climatic and soil requirements of muscadine grapes, planting and cultivating, pruning and training systems, harvesting and handling methods, production and propagation of improved varieties, diseases and insects, varieties and their characteristics, are discussed.—*D. B. Rosenkrans.*

VEGETABLE CULTURE

1946. Anonymous. **Dwarf French beans at Wisley, 1919.** Jour. Roy. Hort. Soc. **45:** 316–333. 1919.—Report is made of the trial of 253 stocks of beans. The awards of the fruit and vegetable committee are given, also a classification of varieties with brief descriptions.—*J. K. Shaw.*

1947. Anonymous. **Irrigation and fertilizer experiments with beets.** Rept. Hort. Exp. Sta. Vineland Sta. Ontario. **1918:** 31–33. 1919.—Nitrate of soda when used with irrigation gave the greatest gains. Nitrate of soda alone gave almost as great gains as when combined with irrigation. Irrigation alone gave a very low average gain over non-irrigation, but varying greatly from year to year with different weather conditions.—*E. F. Palmer.*

1948. Anonymous. **Lettuce at Wisley, 1919.** Jour. Roy. Hort. Soc. **45:** 334–353.—Report is made of the trial of about 280 stocks of lettuce including cutting, cabbage, and cos lettuces. The awards of the fruit and vegetable committee and a classification with brief descriptions are given.—*J. K. Shaw.*

1949. Anonymous. **Winter lettuce at Wisley, 1917–18.** Jour. Roy. Hort. Soc. **45:** 354–359. 1919.—Report is made of the trial of 115 stocks of winter lettuce. The awards of the Judging Committee and a classification with brief descriptions are given.—*J. K. Shaw.*

1950. Bennett, E. R. **The effect of good seed on the vegetable industry.** Monthly Bull. California State Commission Hort. **8:** 298–302. 1919.—Good seed from the growers' standpoint is seed of a given variety, of good viability from high yielding healthy plants, true to the type of given variety, and free from the influences of pollination from other varieties or undesirable strains of the same variety. The grower should therefore get his seed from the professional seedsman to produce a highly standardized and improved crop of vegetables.—*E. L. Overholser.*

1951. Keil, J. B. **Growing garden beans of high quality.** Monthly Bull. Ohio Agric. Exp. Sta. **5:** 287–293. 1920.—The article comprises a description of certain varieties suitable for culture. Special reference is made to the cooking test of the beans in the snap-pod stage. Those found to be most satisfactory when cooked were as follows, named in the order of their excellence: Round-Pod Kidney Wax (Brittle Wax); Burpee's Stringless Green Pod; Wardwell's Kidney Wax; Bountiful; Challenge Black Wax and German Black Wax (Sure crop). A brief description is given of each variety and points of excellence are mentioned.—*R. C. Thomas.*

1952. Mottet, S. **Une nouvelle rhubarbe.** [**A new rhubarb.**] Rev. Hort. **92:** 147–148. *Fig. 53.* 1920.—*Rheum Alexandrae*, introduced in 1909, may prove to be a valuable ornamental

because of its tall stems which bear large, overlapping, creamy white bracts. The flowers are small and inconspicuous. The plants are entirely hardy and are propagated mainly by division of established crowns.—*E. J. Kraus.*

1953. Rogers, S. S. **Vegetable seed improvement.** Monthly Bull. California State Commission Hort. 8: 302–303. 1919.

HORTICULTURAL PRODUCTS

1954. Cruess, W. V. **The evaporation of vegetables.** Monthly Bull. California State Commission Hort. 8: 93–100. 1919.—During the war the great demand for dried vegetables greatly stimulated production. The vegetables are peeled, blanched 3–8 minutes to destroy the oxidase which otherwise brings about discoloration and disagreeable flavor, and dried. The temperature of the evaporator is gradually raised from 120–150° F. Discoloration and decomposition of the products result when temperature goes beyond 150° F. Dried potatoes should contain less than 10 per cent of moisture, other vegetables less than 8 per cent. Immediately after being dried the products are packed in insect-free and moisture-free containers. In the presence of moisture, fungous growth results.—*E. L. Overholser.*

1955. Wood, M. N. **Shall we dry peaches ripe or moderately green?** Monthly Bull. California State Commission Hort. 8: 116–117. 1919.—The dried products from ripe peaches give a larger yield, have better quality, and are more attractive.—*E. L. Overholser.*

1956. Young, W. J. **Products and utilization of Muscadine grapes.** South Carolina Agric. Exp. Sta. Bull. 206. *37 p. Fig. 1–4.* 1920.—The possibilities of muscadine grapes for home and commercial products, and the equipment needed for producing them, are discussed. The characteristics of different varieties making them suitable for various uses are given, as well as directions for the making of such products as grape juices, jellies, canned grapes, flavoring syrups, grape paste, marmalade, preserves, jams, spiced grapes, conserves, mince meat, and catsup.—*D. B. Rosenkrans.*

MORPHOLOGY, ANATOMY, AND HISTOLOGY OF VASCULAR PLANTS

E. W. Sinnott, *Editor*

1957. Bailey, I. W. **The cambium and its derivative tissues. II. Size variations of cambial initials in gymnosperms and angiosperms.** Amer. Jour. Bot. 7: 355–367. *3 fig.* 1920. —The author calls attention to the striking differences in size of secondary xylem cells which characterize various groups of woody plants, and to the fact that in the evolutionary series from gymnosperm tracheid to angiosperm vessel there has been a radical decrease in length. Certain of these size variations are thus evidently germinal, whereas others are somatic or environmental. The size of a given secondary xylem cell is evidently determined by (1) the size of the cambium initial from which it develops and (2) the changes which take place during its differentiation. The author has made a reconnaissance survey covering 32 families, in which he has measured the length of the cambium initials, the vessel segments, and the tracheids or fiber tracheids. Great differences in the length and volume of the cells were observed. In *Ginkgo* and the Coniferae the length of the cambial initials closely resembles that of the last formed tracheids. In most dicotyledons the initials are considerably shorter than the fiber tracheids but are of about the same length as the vessel segments.—The author calls attention to the fact that the cambium "appears to be an unusually favorable medium for the study of problems relating to cell size and body size, the working sphere of the nucleus, the nucleo-cytoplasmic relation, and phenomena of cytokinesis in somatic tissues."—*E. W. Sinnott.*

1958. Brierley, C. H. **Plant hairs.** Ann. Rept. and Trans. Manchester Microsc. Soc. 1916: 55–61. 1918.—A discussion of the nature and location of hairs, of theories regarding the relation of various stimuli to hair production, and of the functions of hairs and other epidermal outgrowths.—*C. E. Allen.*

1959. Campbell, D. H. **The genus Botrychium and its relationships.** Proc. Nation. Acad. Sci. [U. S.] 6: 502–503. 1920.—The embryo of *B. obliquum* Mühl is described. Relationship to *Ophioglossum* and to *Helminthostachys* and the Marattiaceae is indicated. This species and the two others, *B. lunaria* (L.) Sw. and *B. virginianum* (L.) Sw., whose life histories are known, probably differ enough in embryo and sporophyte to be placed in three separate genera.—*Howard B. Frost.*

1960. Daniel, Lucien. **Réactions antagonistiques et rôle du bourrelet chez les plantes greffées. [Antagonistic reactions and the rôle of the fusion layer in vegetable grafts.]** Compt. Rend. Acad. Sci. Paris 170: 1512–1515. 1920.—The fusion layer, especially in herbaceous plants, contains parenchyma which predominates for a long time. The lignified vessels are few and distorted. The fusion layer modifies conduction and hence the quantitative and qualitative distribution of water and solutes. The scion may send off roots either internally or externally. These may penetrate the cortex or pith but rarely the cambium layer. The regenerated branches of the stock often penetrate the cambium layer and thence the cortex, but they have never been found penetrating the pith or dead tissues of the scion. This throws some light on the nature of graft hybrids.—*C. H. Farr.*

1961. Gatin, V. C. **Recherches anatomiques sur le pédoncule et la fleur des Liliacées. [An anatomical study of the peduncle and flower of the Liliaceae.]** Rev. Gen. Bot. 32: 369–437. *Fig. 1–31.* 1920.—An attempt was made to determine whether the histological character of these structures might not be valuable in classification. The plants were studied when in full bloom, but before pollination had taken place. The author finds that the number, structure, and distribution of the vascular bundles in the peduncle, coupled with their distribution to the floral parts, can be used to show the relationship of the tribes, genera, and species in this family. In the first chapter nine tribes of the sub-family Lilioideae are covered.—*J. C. Gilman.*

1962. Nobécourt. **Sur la structure anatomique des tubercles des Ophrydées. [On the anatomical structure of the tubercules of orchids.]** Compt. Rend. Acad. Sci. Paris 170: 1593–1595. *Fig. 1.* 1920.—The "pedicule" upon which the tubercle is borne has arisen by the concrescence of a branch with a leaf and with the cortical tissue of the adventitious root, the lower portion of which gives rise to the tubercle itself. The vascular system of the branch is a schizostele which varies from a monostele to a polystele. The upper part of the tubercle is partly cauline and partly radical. The middle and lower portion is entirely that of the polystelic adventitious root.—*C. H. Farr.*

1963. Schwede, R. **Nochmals über die Lupinenfaser. [More about lupine fibers.]** Jahresber. Ver. Angew. Bot. 16: 14–18. 1918.—A discussion of the relative value of various species of *Lupinus* as a source of commercial fiber. Author describes results of microchemical tests for cellulose, lignin, etc., and compares his results with those of Hanausek. Of the three species which he finds available in sufficient quantity to be of use in the present crisis, he considers the fibers of *Lupinus albus* less suitable than those of *L. lutens* and *L. angustifolius.*—*P. J. Anderson.*

1964. Schwede, R. **Zur Kenntniss der Hopfenfaser. [Investigation of hop fibers.]** Jahresber. Ver. Angew. Bot. 16: 8–13. 1918.—A microscopical and chemical investigation of the bast fibers and adjacent tissues of the hop plant (*Humulus Lupulus* L.) Author finds that the morphological characters are much the same as for other members of the Urticaceae. He believes that the qualities of the fiber are such that they could be used in the manufacture of textiles, at least under stress of such conditions as existed during the world war. The fiber was successfully used in the manufacture of paper.—*P. J. Anderson.*

1965. Trotter, A. **Della supposta partenocarpia del nocciuolo e dei suoi eventuali caratteri: osservazioni ed esperienze.** [On the supposed parthenocarpy of the hazel-nut and its eventual characters.] Atti R. Accad. Lincei, Roma, Rendiconti Cl. Sci. Fis. Mat. e Nat. V, 29[1]: 72–76. *9 fig.* 1920.—Author concludes that vegetative parthenocarpy does not exist in the hazelnut since the female aments do not develop further if the stigmas are not properly pollinated. He found that at the time the stigmas are pollinated the ovary is not yet formed and that it is formed only in flowers whose stigmas are pollinated. Normally there are two ovules of which one, after the period of fecundation, is destined to abort. Even in the majority of nuts that fall prematurely there exist imperfect seeds with atrophied embryos. He therefore concludes that this is not a case of parthenocarpy but that it may represent a form of degeneration of the reproductive phenomena and may be a true type of abortion similar to that in animals.—*F. M. Blodgett.*

1966. Viguier, R., et H. Humbert. **Le Cassytha filiformis.** Bull. Soc. Philomathique Paris X, 10: 53–54. 1918.—A plant of this species is described, growing on a sandy beach near Tamatave, which had grown over a surface of several square meters without finding a possible host plant, and which was forced therefore to lead an independent existence. It had produced abundant flowers and fruits, and its unusual mode of life seemed not to have entailed any morphological modification. Some of the branches, coming in contact with an older branch of the same plant, had coiled about the latter and pushed suckers into it.—*C. E. Allen.*

1967. Weiss, F. E. **Seeds and seedlings of orchids.** Ann. Rept. and Trans. Manchester Microsc. Soc. 1916: 32–43. *Fig. 1–6.* 1918.—The small size of the seeds of orchids and the rudimentary condition of the embryo in mature seeds are discussed in relation to the epiphytic habit of many members of the family. The author describes the mycorhiza of orchids and the bearing of this condition upon their nutrition; the infection of the embryo, previous to the germination of the seed, by the species of *Rhizoctonia* concerned in mycorhizal development; the effect upon the fungus of cultivating it in artificial media; and the replacement of the stimulating effect of the fungus in the germination of orchid seeds by the use of salep decoctions. He compares the conditions in *Calluna vulgaris*, in which case the fungus is already present in the mature seed, with that in orchids, whose seeds must be infected from without.—*C. E. Allen.*

MORPHOLOGY AND TAXONOMY OF BRYOPHYTES

Alexander W. Evans, *Editor*

1968. Anonymous. [**Note without title.**] Nature 104: 572. 1920.—The possible disposition of the important moss herbarium belonging to Jules Cardot is discussed. This herbarium contains between 30,000 and 40,000 specimens, including the types of many new species described by Cardot.—*O. A. Stevens.*

1969. Culmann, P. **Contributions à la flore bryologique de la Suisse et de l'Auvergne.** [Contributions to the moss flora of Switzerland and the Auvergne.] Rev. Bryologique 47: 21–24. 1920.—Distributional and critical notes are given on 7 hepatics and 8 mosses from Switzerland and the Auvergne region of central France. Two of the species represent additions to the flora of Switzerland and 2 to the flora of the Auvergne, while several old records are corrected. Under the name *Lophozia opacifolia* a new subspecies or variety of *L. incisa*, collected by the author in Switzerland, is described.—*A. W. Evans.*

1970. Dismier, G. **Le Frullania riparia Hampe et le Marchantia paleacea Bertoloni a Amélie-les-Bains (Pyr.-Or.).** Rev. Bryologique 47: 24–26. 1920.—The discovery of *Frullania riparia* and *Marchantia paleacea* at Amélie-les-Bains in the department of Pyrénées-

Orientales, France, is announced. Full notes regarding distribution are given under each species, and some doubt is thrown on the validity of the *Frullania*, owing to the constant absence of perianths.—*A. W. Evans.*

1971. Dixon, H. N. **Description of the mosses.** In: Trechmann, C. T. **On a deposit of interglacial loess, and some transported preglacial freshwater clays on the Durham coast.** Quart. Jour. Geol. Soc. London **75**: 200. 1920.—See Bot. Absts. 6, Entry 797.

1972. Dixon, H. N. **Reports upon two collections of mosses from British East Africa.** Smithsonian Misc. Collections **72**[3]: 1–20. *Pl. 1–2.* 1920.—Under this title two papers are included. The first gives a list of 49 mosses collected by the Dümmer-Maclennan Expedition to Mount Elgon. Descriptive and critical notes are interspersed throughout, and the following new species are described: *Anomobryum robustum, Brachymenium stenothecum, Brachythecium Dümmeri, B. ugandae, Bryum brevinerve, Dicranoweisia africana, Holomitrium Maclennani, Neckera submacrocarpa* and *Raphidostegium elgonense.* In addition *Braunia brachytheca* is proposed as a new subspecies of *B. secunda* (Hook.) B. S. G. The second paper is based on a collection of 8 species made by A. Y. Allan in the Aberdare Mountains, near Mount Kenia. The only new species listed is *Kleioweisiopsis denticulata*, which represents the type of a new genus, placed somewhat doubtfully in the Pottiaceae. With a single exception all the new species described are illustrated by habit drawings or by magnified drawings of some of the parts.—*S. F. Blake.*

1973. Dixon, H. N., and W. W. Watts. **Mosses.** Australasian Antarctic Exped. Sci. Rept. Series C. **7**[1]: 1–9. 1918.—The collection reported upon was made by C. T. Harrison and S. E. Jones on "Queen Mary's Land, which is situated on the Antarctic Circle between 90° and 100° E. longitude." The following 5 species are listed: *Ceratodon purpureus* (L.) Brid., *Sarconeurum glaciale* (H. f. W.) Card. & Bryhn, *Grimmia fastigiata* Card., *G. stolonifera* C. M., and *Bryum antarcticum* H. f. W. Under the *Bryum* 5 antarctic species, most of which were proposed by Cardot, are cited as possible synonyms.—*A. W. Evans.*

1974. Husnot, T. **Deux hépatiques nouvelles.** [**Two new hepatics.**] Rev. Bryologique **47**: 26–27. *19 fig.* 1920.—Two new French species of Hepaticae, collected by the author, are described and figured, the first being *Cephaloziella subglobosa* from the department of Calvados and the second *Lophozia Corbieri* from the department of Orne.—*A. W. Evans.*

1975. Potier de la Varde, R. **Observations sur quelques espèces du genre Fissidens.** [**Observations on certain species of the genus Fissidens.**] Rev. Bryologique **47**: 17–18. 1920. —This paper is the continuation of a series the earlier parts of which have already been abstracted. (See Bot. Absts. 5, Entry 628; 6, Entry 158.) In the present part the relationships of the British *Fissidens Lylei* Wils. are discussed, and the conclusion is reached that it is more closely allied to *F. exilis* Hedw. than to *F. exiguus* Sulliv. Whether it represents a distinct species or a form of *F. exilis* is left undecided.—*A. W. Evans.*

1976. Potier de la Varde, R. **Stereophyllum Bremondii Thér. et P. de la V. (Espèce nouvelle du Cambodge).** [**Stereophyllum Bremondii (a new species from Cambodia).**] Rev. Bryologique **47**: 19–20. *2 fig.* 1920.—Under the above name a new species from Cambodia in French Indo-China, collected by De Brémond d'Ars, is described. It is related to *S. Blatteri* Card., from the vicinity of Bombay, and anatomical details of both species are figured.—*A. W. Evans.*

1977. Potier de la Varde, R. **Tératologie.** Rev. Bryologique **47**: 20–21. *2 fig.* 1920. —A moss-seta of *Bryum Donianum* Grev. bearing two capsules united at the base is described and figured. Each capsule shows a typical external peristome with 16 teeth.—*A. W. Evans*

MORPHOLOGY AND TAXONOMY OF FUNGI, LICHENS, BACTERIA, AND MYXOMYCETES

H. M. Fitzpatrick, *Editor*
Carlos Chardon, *Assistant Editor*

FUNGI

1978. Buller, A. H. R. **Three new British Coprini.** Trans. British Mycol. Soc. 6: 363–365. 1920.—*Coprinus echinosporus* Buller is described as a new species and *C. bisporus* Lange and *C. curtus* Kalchbr. are described as new to England.—*W. B. McDougall.*

1979. Clinton, George P. **Moldy unsalted butter.** Connecticut [New Haven] Agric. Exp. Sta. Bull. 222. *400–404.* 1920.—The following fungi were found on butter samples: *Mucor* sp., *Alternaria* sp., *Penicillium roquiforti, Oidium lactis, Epicoccum* sp. Brief reference to the literature is given.—*Henry Dorsey.*

1980. Coker, W. C. **Notes on the lower Basidiomycetes of North Carolina.** Jour. Elisha Mitchell Sci. Soc. 35: 113–182. *Pl. 23 (in color) and 30–67.* 1920.—Author treats three species of *Gymnosporangium*, one of *Auricularia*, one of *Saccoblastia*, two of *Platygloea*, three of *Septobasidium*, one of *Sirobasidium*, and species of *Exidia, Naematelia, Tremella, Tremellodon, Tremellodendron, Eichleriella, Sebacina, Dacryomyces, Dacryomitra, Dacryopsis, Guepinia, Ditiola*, and *Calocera.* Of these, those reported as new are: *Saccoblastia ovispora* var. *caroliniana, Platygloea caroliniana, Platygloea Lagerstroemiae, Exidia Beardsleei* Lloyd, *Naematelia quercina, Tremella aspera, T. carneoalba, T. subanomala, Dacryomyces Ellisii, D. pallidus, D. fuscominus, Dacryopsis ceracea, Ditiola albizziae, Calocera cornea* var. *minima. Exidia pedunculata* B. & C. is shown to be a *Dacryomyces.* Of the genera treated, *Saccoblastia, Platygloea*, and *Sirobasidium* have not been reported before from North America.—*W. C. Coker.*

1981. Coker, W. C., and J. N. Couch. **A new species of Achlya.** Jour. Elisha Mitchell Sci. Soc. 36: 100–101. 1920.—*Achlya Orion* is described. It is nearest apparently to *A. polyandra* Hildb.—*W. C. Coker.*

1982. Elliott, Jessie S. Bayliss. **On the formation of conidia and the growth of the stroma of Daldinia concentrica.** Trans. British Mycol. Soc. 6: 269–273. *Pl. 6.* 1920.—Observations and cultural experiments covering more than five years show that the conidial form of *Daldinia concentrica* is a *Botrytis* and is common on ash logs. The zoning so characteristic of the perithecial stroma is due to the formation of successive layers of perithecia. The formation of perithecia begins when the stroma is only 3 or 4 mm. in diameter but only those of the last formed zone reach maturity. Spore discharge from mature perithecia continues for several weeks, the asci coming up to the orifice one at a time and discharging their spores.—*W. B. McDougall.*

1983. Elliott, Jessie S. Bayliss. **Studies in Discomycetes II.** Trans. British Mycol. Soc. 6: 263–268. *Pl. 6.* 1920.—In addition to descriptions of five other species and varieties *Phoma conicola* and *Mollisia Populi* are described as new.—*W. B. McDougall.*

1984. Elliott, W. T., and Jessie S. Elliott. **The sequence of fungi and Mycetozoa.** Jour. Botany 58: 273–274. 1920.—An oak tree blown down by a gale in 1912 was observed to note the sequence of fungi growing upon it. The fungi were as follows, appearing in the order given: *Bulgaria polymorpha, Coryne sarcoides, Stereum hirsutum, Panus stypticus, Hypholoma fasciculare, Phlebia merismoides, Hypholoma sublateritium, Pluteus cervinus.* The slime mould *Physarum nutans* appeared in 1919, followed by *Stemonitis fusca.* The mycetozoa occupied the place formerly occupied by *Bulgaria polymorpha* and *Coryne sarcoides*, which disappeared in 1916 and 1917 respectively.—*K. M. Wiegand.*

1985. Rosen, H. R., and R. S. Kirby. **A comparative morphological study of aecia of four different rusts found upon barberries in North America.** Phytopath. 9: 569–573. *2 pl., 1 fig.* 1919.—This is a comparative study of the aecial stage of *Puccinia graminis*, *P. oxalidis*, *P. fendleri*, and *Aecidium butlerianum* occurring on the various species of *Berberis* in North America.—*J. G. Dickson.*

1986. Searle, G. O. **Some observations on Erysiphe Polygoni DC.** Trans. British Mycol. Soc. 6: 274–293. 1920.—Out of seventy-seven varieties of swedes, turnips, and rape none were found immune to *Erysiphe Polygoni* though the swedes were attacked more vigorously than the turnips. The form of *Erysiphe Polygoni* attacking *Brassica campestris* and *B. oleracea* is a biologic form with the additional distinction that inoculations from *B. campestris* to *B. oleracea* invariably give "subinfections" as a result. "Subinfections" were observed in the field on varieties of *B. oleracea* and were found to survive the winter and in some cases to grow into full infections. Conidia were shown by inoculation experiments to be viable. A probable method of over-wintering of the fungus on cultivated species of *Brassica* is by means of "subinfections" on varieties of *B. oleracea* aided by persistent mycelium on varieties of *B. campestris*.—*W. B. McDougall.*

1987. Smith, A. Lorrain. **A drain-blocking fungus.** Trans. British Mycol. Soc. 6: 262–263. 1920.—*Fomes ulmarius* was found in, and completely closing, a drain-pipe 30 feet below ground.—*W. B. McDougall.*

1988. Smith, A. Lorrain. **Pimina parasitica Grove.** Trans. British Mycol. Soc. 6: 295–296. 1920.—*Pimina parasitica* Grove is identical generically if not specifically with *Urophiala mycophila* Vuill. Vuillemin believes that Grove's genus should be discarded because of its very imperfect description. If this contention is accepted, Grove's species becomes *Urophiala parasitica;* if the genus *Pimina* is accepted then Vuillemin's species becomes *P. mycophila*.—*W. B. McDougall.*

1989. Stone, R. E. **Upon the audibility of spore discharge in Helvella elastica (Bull.).** Trans. British Mycol. Soc. 6: 294. 1920.—The puff of spores from fruit-bodies of *Helvella elastica* was found to be accompanied by a distinct hissing sound which could be heard at a distance of five or six feet from a covered basket containing the fungi.—*W. B. McDougall.*

1990. Stone, R. E. **Upon the visibility of spore dissemination in Fomes pinicola (Swartz.) Fr.** Trans. British Mycol. Soc. 6: 293. 1920.—By taking a position such that the fungus was between the observer and the sun, clouds of spores were seen streaming from the under side of a fruit-body of *Fomes pinicola*.—*W. B. McDougall.*

1991. Wakefield, E. M. **The Baslow foray.** Trans. British Mycol. Soc. 6: 239–247. 1920.—The twenty-third annual Fungus Foray, which was held at Baslow, Derbyshire, from September 22 to September 27, 1919, is described and a complete list of the fungi gathered, numbering 391 species, is given.—*W. B. McDougall.*

LICHENS

1992. Mereschkovsky, C. **Note sur quelques Ramalina de la Russie. [New forms of Ramalina from Russia.]** Bull. Soc. Bot. Genève 11: 151–153. *1 fig.* 1919.—The characteristics of the following forms are indicated: *Ramalina pollinaria* (Westr.) Ach. form *elegantella* Mer., *R. pollinaria* (Westr.) Ach. form *conglobata* Mer., and *R. calicaris* (L.) Fr. var. *taurica* Mer. forms *macrocarpa* and *tenella*.—*W. H. Emig.*

1993. Moreau, Fernand. **Les différents aspects de la symbiose lichénique chez le Ricasolia herbacea DN. et le Ricasolia amplissima Leight. [The different aspects of lichen symbiosis in Ricasolia herbacea and R. amplissima.]** Compt. Rend. Acad. Sci. Paris 170: 1401–1404. *Fig. 1–4.* 1920.—In *R. herbacea* tubercles are produced on the lower surface of

the thallus by hyphae enveloping algal cells. Frequently the algae in these tubercles are completely consumed by the fungus. In *R. amplissima* there are similar tubercles, but in some cases they enlarge to such an extent that they push up through the cortical layer and form a much branched protuberance on the upper surface of the thallus. In this case the symbiosis is harmonious.—*C. H. Farr.*

1994. Paulson, R., and S. Hastings. **The relation between the alga and fungus of a lichen.** Jour. Linn. Soc. London Bot. **44**: 497–506. *Pl. 21–22.* 1920.—A study to determine the frequency of penetration of the algal cells of lichens by the fungus hyphae. Several common British species were examined thoroughly. Only two forms of contact between hypha and gonidium were noted:—gonidium surrounded by loosely applied hyphae; hypha modified in shape so as to present considerable surface to the gonidium to which it is intimately applied. No penetration of living gonidia by hyphae was found. The gonidia do not increase vegetatively, but produce "autospores," daughter gonidia, usually 8 or 16, within the mother cell. The wall of the latter is dissolved. The protoplast of the gonidium is described. Many gonidia die, apparently because of "crowding together and lack of air," and the contents of such cells are absorbed by the fungus hyphae, often without penetration of the wall. The alga in the lichens studied is probably a species of *Chlorella.*—*A. J. Eames.*

1995. Smith, A. Lorrain. **Lichens of the Baslow foray.** Trans. British Mycol. Soc. **6**: 252. 1920.—A brief report on the lichens found in the vicinity of Baslow, Derbyshire, in September 1919. Lichens were found to be scarce here because of the smoke from neighboring towns.—*W. B. McDougall.*

BACTERIA

1996. Albert, Henry. **A classification of diphtheria bacilli based on the toluidin blue-iodine method of staining.** Amer. Jour. Public Health **10**: 936–939. *5 fig.* 1920.—The author claims that the toluidin blue-iodine method of staining gives a more reliable estimate of the virulence of diphtheria bacilli than any other method, and presents a classification of the bacteria based on their staining reactions with this stain.—*C. A. Ludwig.*

1997. Albert, Henry. **Diphtheria bacillus stains with a description of a "new" one.** Amer. Jour. Public Health **10**: 334–337. 1920.—The author notes defects in results obtained with several stains already in use and describes a new one which he thinks better than any of the others.—*C. A. Ludwig.*

1998. Epstein, Alexandre. **Un nouvel agent destructeur des polysaccharides complexes: Pseudomonas polysaccharidum (n. sp.). [A new organism which breaks up complex polysaccharides: Pseudomonas polysaccharidum n. sp.]** Bull. Soc. Bot. Genève **11**: 191–198. 1919.—This new bacterium was obtained as a contamination on an artificial medium. The following carbohydrates were changed by it: glucose, galactose, maltose, lactose, dextrin, and starch. —*W. H. Emig.*

1999. Jordan, Edwin O. **Biology of the Pfeiffer bacillus.** Amer. Jour. Public Health **10**: 648. 1920.—Certain cultural reactions of the Pfeiffer bacillus are mentioned by means of which it can be differentiated from certain other organisms.—*C. A. Ludwig.*

2000. Kelly, F. B. **On the solution of pneumococci by bile.** Amer. Jour. Public Health **10**: 708–712. 1920.—The author finds that the lytic action of bile and its different preparations on pneumococci and the resistance of pneumococci to lysis by bile are variable. "If a coccus dissolves it is undoubtedly a pneumococcus; but if a solution is only partial, this fact does not necessarily rule out the possibility of the strain belonging to this group.—*C. A. Ludwig.*

2001. Muer, Theodore C., and Robert L. Harris. **Value of brilliant-green in eliminating errors due to the anaerobes in the presumptive test for B. coli.** Amer. Jour. Public

Health 10: 874–875. 1920.—The claim is made that the production of more than 10 per cent of gas in brilliant-green lactose bile would seem to be no longer a "presumptive," but a "positive" test for *B. coli*. The medium is composed of 50 grams dried oxgall, 10 grams peptone, 10 grams lactose, and 0.1 gram brilliant-green (commercial salt of tetraethyldiaminotriphenyl-carbinol) to 1 liter of water.—*C. A. Ludwig.*

MYXOMYCETES

2002. Elliott, W. T., and Jessie S. Elliott. **The sequence of fungi and mycetozoa.** Jour. Bot. 58: 273–274. 1920.—See Bot. Absts. 7, Entry 1984.

2003. Ferdinandson, C., and Ö. Winge. **Clathrosorus, a new genus of Plasmodiophoraceae.** Ann. Bot. 34: 467–469. *1 pl.* 1920.—A description is given of a myxomycete parasitic on the bluebell, *Campanula rapunculoides*, in Denmark. The cytological features of the parasite are in close agreement with those of the Plasmodiophoraceae. The mature sorus is irregular or rounded, and is traversed by cavities. The individual spores are not so firmly connected as in *Sorosphaera*. The spores at maturity show a finely punctate, warty membrane, and in this characteristic differ from all other known genera of the Plasmodiophoraceae. A diagnosis of the new genus and species is given.—*W. P. Fraser.*

2004. Lister, Gulielma. **Mycetozoa found during the Baslow foray.** Trans. British Mycol. Soc. 6: 248–252. 1920.—The myxomycetes found in the vicinity of Baslow, Derbyshire, in September, 1919, are reported with brief notes on the habitats of a number of species. A total of 45 species was collected.—*W. B. McDougall.*

PALEOBOTANY AND EVOLUTIONARY HISTORY

E. W. Berry, *Editor*

2005. Bower, F. O. **The earliest known land flora.** Nature 105: 681–684, 712–714. *5 fig.* 1920.—(Discourse delivered at the Royal Institution, Apr. 30.) A review of some general features of Carboniferous and Devonian plants. Description and discussion of *Sporogonites*, possibly an early Devonian bryophyte; also of *Rhynia* and *Asteroxylon* described by Kidston and Lange from the Rhynie chert in Scotland. Psilotaceae, a group of living pteridophytes with imperfect morphological differentiation, is discussed.—*O. A. Stevens.*

2006. Carpentier, A. **Notes d'excursions paléobotaniques a Chalonnes et Montjean (Maine-et-Loire).** [**Notes on paleobotanical collections from Chalonnes and Montjean, Maine and Loire.**] Bull. Soc. Géol. France IV, 19: 262–272. *Pl. 7–8.* 1920.—From the Devonian schistes of Chalonnes the author records various undeterminable scraps and specimens of *Psilophyton spinosum* Potonié and Bernard. From the lower Carboniferous (Culm) are recorded *Lepidodendron acuminatum, Stigmaria ficoides, Pinnularia mollis, Archaeocalamites scrobiculatus, Sphenopteris hochstetteri, Sphenopteris schimperiana (?), Archaeopteris pachyracha* and *Pteridorachis.* From the Lower Carboniferous of Montjean are recorded *Archaeocalamites scrobiculatus, Paleoastachya, Lepidodendron selaginelloides, Lepidophyllum lanceolatum, Ulodendron minus, Sphenopteris elegans, Sphenophyllum tenerrimum, Sphenopteris dissecta, Zeilleria moravica, Asterophyllites, Dactylotheca aspera, Pecopteris plumosa, Lepidostrobus variabilis, Calymmatotheca andegavensis* and *Telangium affine.*—*E. W. Berry.*

2007. Church, A. H. **Thallassiophyta and the sub-aerial transmigration.** Oxford Bot. Mem. 3. *95 p.* 1919.—A speculation on the origin of land plants. The author considers that life originated through the action of radiant energy acting on ionized sea water on a gradually cooling earth. The first stage of life is termed the Plankton stage. With the shallowing of the supposed universal primeval ocean and the approach of the bottom within the influence of the sunlight the second, or Benthonic stage, was inaugurated. During this long continued stage of evolution a great variety of marine life was differentiated including all of those structures that

the land plants have as a part of their inheritance, e.g., archegonia, alternation of sporophyte and gametophyte generations, etc. By the progressive lifting of the densely populated sea-bottom, especially in regions of tropical temperatures and abundant insolation, the beginnings of the subsequent land flora were differentiated from different algal types. It follows that the different lines of terrestrial plants are only indirectly related through their algal ancestors, that is, they are strictly polyphyletic, and some, such as the Lycopodiales, are considered to have had an independent ancestry from the Plankton stage. The various characters that tie the vascular plants together are thus considered as the results of their like physiologic experience in passing from a dense medium, poor in oxygen and light and rich in nutrient salts, into a rare medium with abundant oxygen and light, but deficient in nutrient salts and water. The author considers that such a form as *Chara* points the way but failed at the time of the transmigration by having lacked a diploid phase to produce wind dispersed spores. The Florideae failed to pass the test by reason of their inefficient cellular organization and the Phaeophyceae by reason of their never having attained fertilization in situ.—*E. W. Berry.*

2008. Dollfus, G. F., et P. H. Fritel. **Catalogue raisonné des Characées fossiles du Bassin de Paris. [Critical enumeration of the fossil Characeae of the Paris Basin.]** Bull. Soc. Géol. France IV, 19: 243–261. *Fig. 23*. 1920.—A critical discussion, with illustrations, of the species of *Chara* founded upon stems and oogonia and recorded from the Tertiary deposits of the Paris Basin. Twenty species and varieties are recognized and these are distributed chronologically as follows: Lower Eocene—Thanetian 2, Sparnacian 6; Middle Eocene —Lutetian 3, Auversian 2; Upper Eocene 5; Lower Oligocene 3; Upper Oligocene 5.—*E. W. Berry.*

2009. Fritel, P. H. **Sur l'existence de l'Œillette: Papaver somniferum var nigrum D. C., en Provence, a l'époque quaternaire. [On the existence of the poppy, Papaver somniferum var. nigrum, in the Pleistocene of Provence.]** Compt. Rend. Soc. Géol. France 15: 186. Nov. 22, 1920.—Records a fossil capsule, identical with that of the existing form, from the Pleistocene of Aygalades in southeastern France.—*E. W. Berry.*

2010. Holmsen, Gunnar. **Naar invandret granskogen til Kristianiatrakten? [Does the immigrated spruce reach vicinity of Kristiania?]** Tidsskr. Skogbruk 28: 165–171. 1920.—Data and discussion bearing on the time at which Norway spruce, *Picea excelsa*, immigrated to certain parts of Norway. The evidence is furnished by the number of spruce pollen grains found in swamp strata. The spruce came after the Stone Age and before the Bronze Age, the latter being fixed at about 1800 B.C.—*J. A. Larsen.*

2011. Kryshtofovich, A. A. **Cycadean trunk from Hokkaidō.** Jour. Geol. Soc. Tokyo 27: 1–8. *Pl. 19.* 1920.—Describes from a photograph of a trunk and from microphotographs of histological preparations, a new species of cycad trunk, *Cycadeoidea ezoana*, from the Cretaceous of Hokkaidō, Japan. The features are not especially distinct but the specimen is of unusual interest in indicating a new locality for petrified trunks, and the only known one throughout the vast expanse of Asia except for vague references to the occurrence of similar forms in the upper Gondwana series of India.—*E. W. Berry.*

2012. Reid, E. M. **On two preglacial floras from Castle Eden (County Durham).** Quart. Jour. Geol. Soc. London 76: 104–144. *Pl. 7–10.* 1920.—From disturbed clays beneath the Boulder Clay on the Durham coast the author records 125 species of seeds. Part of the collection, comprising 11 species, are all still-existing temperate British forms and are considered as of uppermost Pliocene in age and younger than the Cromerian (many regard the Cromerian as post Pliocene and the English representative of the first Interglacial). The balance, with many exotic forms, are considered as coming from about the middle of the Middle Pliocene. The most abundant form is *Potentilla argentea;* next come a species of *Erica*, two of *Ranunculus*, and an extinct *Melissa*. The trees and shrubs include *Liquidambar*, *Carpinus* (a Japanese form), *Betula*, *Alnus*, *Crataegus*, *Rubus*, *Ilex*, *Rhus*, *Aralia*, *Erica*, *Solanum*, and *Spiraea*. The environment is pictured as an upland valley with steep hillsides, partly

open and partly forested. The land stood 400 to 500 feet higher than now and the sea was some distance away. Sixty-four per cent of the forms are exotic or extinct, and 31 per cent are Chinese or North American. Two species of *Crataegus*, one of *Potentilla*, and one each of *Rhus*, *Ilex*, and *Melissa* are described as new.—*E. W. Berry.*

2013. Reid, E. M. **A comparative review of Pliocene floras, based on the study of fossil seeds.** Quart. Jour. Geol. Soc. London **76**: 145–161. 1920.—Amplifying a previously expressed theory the author adds weight to the conception that late Tertiary times witnessed the existence and gradual extinction in western Europe of the Tertiary Holarctic flora, or one closely allied to that still existing in the uplands of North America and eastern Asia. It was only in these two regions that the Pliocene flora was enabled to survive glaciation because of the absence of barriers to their southward retreat and subsequent northward advance. Gradual refrigeration of the climate during the Pliocene is an essential part of the picture.—By taking accurately determined seeds from the fossil floras known as the Pont-de-Gail, Reuverian, Castle Eden, Teglian and Cromerian, and determining the percentages of exotic and extinct species and the percentages of Chinese and North American forms the author plotted a curve which is regular both for the exotic element and for the North American-Chinese part. According to this method the Pont-de-Gail (Cantal) and Reuverian (Dutch-Prussian border) floras are Lower Pliocene; the Castle Eden (Durham) flora is Middle Pliocene; the Teglian (Dutch) flora is lower Upper Pliocene and the Cromerian (S. E. England) flora is uppermost Pliocene. Lists of species for each are given.—*E. W. Berry.*

2014. Seward, A. C. **The oldest land-vegetation.** Scientia **28**: 157–164. Sept., 1920.—A general sketch with especial mention of the Devonian plants *Rhynia*, *Hornea*, and *Asteroxylon* described recently by Kidston and Lang, and a brief account of Church's speculation on the origin of land plants.—*E. W. Berry.*

2015. Seward, A. C., and A. Sahni. **Indian Gondwana plants: A revision.** Mem. Geol. Surv. India **N. S., 7**[1]: 1–54. *Pl. 1–7.* 1920.—An account of a restudy of old collections from various horizons in the Gondwana beds of India. From the lower Gondwana, of Permo-Carboniferous age, 16 plants are described. These are all old forms with the exception of a new species of *Samaropsis*, but several taxonomic changes are suggested: *Noeggerathiopsis* is definitely referred to *Cordaites;* the new genus *Buridia* is proposed for a form which Feistmantel described as *Voltzia;* a probable *Araucaria*, which was described by Zeiller as *Fraucarites*, is made the basis of the new genus *Morania;* and the new genus *Barakaria*, of unassigned affinity, is erected for what Feistmantel called *Cyclopitys dichotoma.* Thirty-one plants are recorded from various horizons of the upper Gondwana, of Jurassic age. These comprise Lycopodiales 1, Filicales 3, Cycadophytes 15, Ginkgoales 2, Araucariaceae 3, Taxaceae 1, and 6 conifers of uncertain relationship. A variety of *Otozamites* and a species of *Nilsonia* are described as new, and *Cycadites constrictus* Feistmantel is transferred to the genus *Torreyites.* Several epidermal and stomatal preparations are described, many of the old types are illustrated by new and better figures, and several are figured for the first time.—*E. W. Berry.*

2016. Stopes, Marie C. **Bennettites Scottii, sp. nov., a European petrifaction with foliage.** Jour. Linn. Soc. London Bot. **44**: 483–496. *Pl. 19–20, fig. 1–4.* 1920.—A description of a small and very young specimen of *Bennettites* with fairly well preserved bud-leaves. Three types of ramenta occur on these leaves. No fruit is present. There is evidence that the specimen is a "sproutling." It is described as *B. Scottii.*—*A. J. Eames.*

PATHOLOGY

G. H. Coons, *Editor*
C. W. Bennett, *Assistant Editor*

PLANT DISEASE SURVEY (REPORTS OF DISEASE OCCURRENCE AND SEVERITY)

2017. Clinton, George P. **New or unusual plant injuries and diseases found in Connecticut, 1916–1919.** Connecticut [New Haven] Agric. Exp. Sta. Bull. 222. *404–482.* 1920.

2018. Dana, B. F., and Geo. L. Zundel. **Head smut of corn and sorghum.** Washington [State] Agric. Exp. Sta. Popular Bull. 119. *8 p., 4 fig.* 1920.—Reports the first occurrence of head smut (*Sphacelotheca reiliana*) on corn from Washington. A discussion of symptoms and effects is followed by a comparison of head smut and common smut.—*F. D. Heald.*

2019. Peyronel, Beniamino. **Un interessante parassita del lupino non ancora segnalato in Italia: Blepharospora terrestris (Sherb.) Peyr.** [A parasite of lupine newly found in Italy.] Atti R. Accad. Lincei Roma Rendiconti Cl. Sci. Fis. Mat. e Nat. V, 29[1]: 194–197. 1920.—A new disease of *Lupinus albus*, from the vicinity of Lake Regillo, was found to be readily communicated to healthy plants from diseased plants when both were placed in the same pot in saturated soil. The fungus appeared to be identical with *Phytophthora terrestria* Sherbakoff. The author places the fungus in the genus *Blepharospora*, however, because it resembles so closely *B. cambivora* of Petri, whence *Blepharospora terrestris* (Sherb.) new comb.—*F. M. Blodgett.*

2020. Sanders, J. G. **The European potato wart disease discovered in Pennsylvania.** Monthly Bull. California State Commission Hort. **8**: 10–12. 1919.—The potato wart disease, (*Chrysophlyctis endobiotica*), introduced from Europe, was discovered in Pennsylvania in 1910. The disease manifests itself in the form of warty growths which rapidly multiply until they cover the entire potato. The heavy-celled winter spores resulting from the decay of the infected tuber remain visible and dangerous in soil for at least 6–8 years; control therefore requires a considerable term of years of crop rotation in the absence of potatoes, for it seems the disease attacks only the potato plant.—*E. L. Overholser.*

THE PATHOGENE (BIOLOGY, INFECTION PHENOMENA, DISPERSAL)

2021. Doran, Wm. L. **The minimum, optimum and maximum temperatures of spore germination in some Uredinales.** Phytopath. **9**: 391–401. *1 fig.* 1919.—Experiments were conducted to determine the critical temperatures for the germination of aeciospores of *Gymnosporangium clavipes*, urediniospores of *Puccinia antirrhini*, teliospores of *Puccinia malvacearum*, and urediniospores of *Uromyces caryophyllinus*. The minimum, optimum, and maximum temperatures (Centigrade) based on the number of spores germinating (listed in the above order) are: 5, 12, and 19; 8, 14, and 25; 9, 16, and 29; 5, 10, and 20; 3, 14, and 30; and 4, 14, and 29 respectively.—*J. G. Dickson.*

2022. Drechsler, Charles. **Cotyledon infection of cabbage seedlings by Pseudomonas campestris.** Phytopath. **9**: 275–282. *6 fig.* 1919.—When cabbage seeds were planted in greenhouse soil heavily infested with the black rot organism, the infection was confined to the region along the sinuses at the margins of the cotyledons. The bacteria invaded through stomata located on the edge of, or a slight distance back of, the sinus. Subsequent progress of the organism is similar to that previously described in older plants by Smith. Cavities develop most rapidly in the stem near the attachment of the cotyledons. No evidence of infection by way of the roots was secured. There was no indication of secretion by the parasite of a soluble toxic substance capable of diffusing for even very slight distances. Guttation drops were formed only along the sinuses of the cotyledons; infection was readily secured by inoculation of these drops with the organism.—*J. C. Walker.*

2023. Giddings, N. J., and Anthony Berg. **A comparison of the late blights of tomato and potato.** Phytopath. 9: 209–210. *1 pl.* 1919.—A preliminary report upon the pathogenicity of three strains of *Phytophthora infestans* isolated from potatoes (2 strains) and tomatoes (1 strain). The strain from tomato showed greater pathogenicity for young tomato plants than did either of the two strains from potato. Sporulation of the potato strains occurred very sparingly on the spots produced on the tomato leaves.—*G. H. Coons.*

2024. MacMillan, H. G. **Wind, and the distribution of pathogenic soil organisms.** Phytopath. 9: 471–474. *2 fig.* 1919.—A hypothetical discussion of the relation of dust storms to the distribution of soil organisms.—*J. G. Dickson.*

2025. Pantanelli, E. **Contributi alla biologia della peronospora della vite. [The biology of the peronospora of the vine.]** Rev. Patol. Veg. 10: 51–72. 1920.—In studying the conditions favorable for the infection of the grape by *Plasmopara viticola*, it was found that soil moisture and humidity of the air both have an influence on the stomatal openings. If the soil moisture is below 15 per cent the stomata do not open unless the humidity of the air is above 80 per cent. If the soil moisture is above 20 per cent, the stomata open, provided the humidity of the air does not go below 40 per cent. The condensation of water on the foliage has an action opposed to that of the soil. The higher humidity of the air also favors attacks by the fungus because of its effect on the composition of the leaves, the latter having under these conditions a higher proportion of soluble carbohydrates, nitrogen, and phosphorus. That the stomates are closed in young leaves is held to be a sufficient reason why infection does not commonly take place; these young organs also contain little sugar and starch, and nitrogenous compounds soluble in water are almost completely absent. No close parallelism was found between the concentration of the cell sap and receptivity, though increase of turgescence seemed to be favorable to the fungus. A study was made of the chemotactic influence of various substances on the zoospores. Analyses of spots in the leaf showed that in the oily spots the starch had decreased but that there had been an increase in a zone surrounding the spots over that in the rest of the leaf. The percentage of sugar had decreased in the spots also, but the surrounding zone and the rest of the leaf had the same sugar content. Studies were made of the nutrition of the fungus in the leaf. Bibliography appended.—*F. M. Blodgett.*

2026. Reddick, Donald, and V. B. Stewart. **Transmission of virus of bean mosaic in seed and observations on the thermal death-point of seed and virus.** Phytopath. 9: 445–450. 1919.—Hypodermic injections of juice from mosaic bean plants failed to produce disease in beans although high percentage of infection was obtained by rubbing juvenile leaves with crushed diseased leaves. The disease is not readily communicated from plant to plant by ordinary contact. Seeds from diseased plants immersed for 4 hours in bleaching powder solution gave 50 per cent of mosaic plants. Dry heat treatments ranging from 60 (1 to 24 hrs.) to 80°C. (10 min.) failed to kill the virus, although the higher temperature injured the viability of the seeds. Moist heat (70°C. for 15 min.), although reducing germination markedly, did not kill the virus.—*G. H. Coons.*

2027. Snell, Walter H. **Observations on the relation of insects to the dissemination of Cronartium ribicola.** Phytopath. 9: 451–464. 1919.—The author gives a list of species of insects bearing aeciospores in varying quantities found in June, 1919, on or near blister rust lesions on *Pinus Strobus*, and a list of insects bearing urediniospores found in 1918 on *Ribes* bushes. The author concludes that while the spread of *Cronartium ribicola* by insects from pine to *Ribes* or vice versa may be infrequent and accidental, the spread of the uredinial stage upon *Ribes* probably occurs with some regularity.—*J. G. Dickson.*

2028. Taylor, Minnie W. **The overwintering of Cronartium ribicola on Ribes.** Phytopath. 9: 575. 1919.

THE HOST (RESISTANCE, SUSCEPTIBILITY, MORBID ANATOMY AND PHYSIOLOGY)

2029. Bakke, A. L. **The comparative rate of desiccation of tubers from normal and diseased potato plants.** Phytopath. 9: 541–546. *1 fig.* 1919.—The moisture losses of Rural New Yorker and Eureka potato tubers from healthy plants and from plants showing the curly-dwarf disease were studied under storage conditions. The tubers from diseased plants on being desiccated reached an equilibrium with the evaporating power of the air sooner than did tubers from healthy plants of the same variety. This increased water loss from diseased tubers was due to the development of fissures in the suberized epidermis. The curly-dwarf tubers when completely dried showed a greater water absorbing capacity than desiccated normal tubers under similar conditions.—*J. G. Dickson.*

2030. Shapovalov, M., and H. A. Edson. **Wound-cork formation in the potato in relation to seed piece decay.** Phytopath. 9: 483–496. *3 fig.* 1919.—The writers show that sprouting alone does not affect the ability of potato tubers to form cork over wound surfaces, but that the drying or shriveling of the tissues, which usually accompanies germination when in warm storage, checks rapid cork formation over cut surfaces. They further demonstrate the general susceptibility of badly shrunken tubers to attack by decay producing organisms in the soil. The resistance of the seed piece to attacks diminishes in direct proportion to the water loss from the tuber. A shriveled tuber must first imbibe the necessary water from the soil before it is able to initiate cell division; consequently, destructive activities of micro-organisms develop so rapidly that formation of the protective cork layer in the shriveled tubers comes too late to check invasion. Proper storage conditions for seed potatoes—a reasonably low temperature and suitable humidity to prevent excessive evaporation—will control the seed piece rot under generally existing conditions.—*J. G. Dickson.*

2031. Stoklasa, Jules. **Action de l'acide cyanhydrique sur l'organisme des plantes. [The effect of hydrocyanic acid on the plant organism.]** Compt. Rend. Acad. Sci. Paris 170: 1404–1407. 1920.—Quantities up to 4 per cent (by volume) of hydrocyanic acid were tested. With *Tilletia tritici*, 1 per cent reduces and 2 per cent strength prevents spore germination. Other microorganisms tried showed greater resistance, e.g., *Bacillus subtilis* and *B. mesentericus vulgatus* which resist 3 per cent and *Aspergillus* which will withstand 4 per cent. *Mucor* and *Penicillium* are killed by 3.5 per cent. This gas is found valuable in disinfecting seeds, as 1 to 2 per cent while reducing infection does not hinder wheat germination. It is necessary to dry the seeds in the open air for 3 days before attempting to germinate them.—*C. H. Farr.*

DESCRIPTIVE PLANT PATHOLOGY

2032. Afonso, Pedro Correia. **Algumas doencas do arroz. [Some diseases of rice.]** Bol. Agric. Nova Goa [Portuguese East India] 1: 113–128. *7 fig.* 1919.—A brief description of certain of the more serious rice diseases of British India which might be introduced with seed grain.—*John A. Stevenson.*

2033. Anonymous. **Silver leaf disease.** Jour. Roy. Hort. Soc. 45: 313–315. 1919.

2034. Atanasoff, Dimitr. **Fusarium-blight (scab) of wheat and other cereals.** Jour. Agric. Res. 20: 1–32. 1920.—The chief cause of "scab," or headblight, and one of the chief causes of rootrot of the cereal crops in the central and eastern cereal growing regions of the United States is a *Fusarium* known in its ascigerous form as *Gibberella saubinetii.* However, in fewer cases headblight is caused by each of nine other species and rootrot by four other species of *Fusarium. Gibberella saubinetii* attacks either the roots, causing rootrot, or the stems and head, causing scab. The present paper deals primarily with the latter condition. A careful description of the blighting of each stage of the host is given. In the case of the blighting of the heads, it was found that the infection was first detected three to four days after

inoculation as small, brown, water-soaked spots on the glumes and that infection proceeds only from the head downward.—Conidia and perithecia are produced in abundance on the attacked parts of the host and the spores may be spread by wind and water. The first natural infection causing the scab, or headblighting, takes place during the latter part of the blossoming period. The secondary infections follow soon after the primary ones and are the more destructive. The fungus winters over as mycelium and conidia in or on the seed, straw, and soil, and also as undeveloped perithecia.—The ascigerous stage develops in midsummer on affected plant parts that are kept moist. Development is secured in pure culture on stems of various sorts that are kept uniformly moist.—Rainy and cloudy weather favor blight attacks.—A marked difference in varietal susceptibility occurs among the spring-wheats. Red Fife and Marquis are among the most susceptible, while Bluestem is the most resistant.—*R. S. Kirby.*

2035. Brittlebank, C. C. **Tomato diseases.** Jour. Dept. Agric. Victoria **18**: 413–416. 920.—Diseases common to tomatoes are described.—*J. J. Skinner.*

2036. Clinton, George P. **Dry rot.** Connecticut [New Haven] Agric. Exp. Sta. Bull. 222. *398–400.* 1920.—Dry rot fungus, *Merulius lacrymans*, is reported to have destroyed the floor of an unoccupied cottage in a period of 5 years. Two other cases of similar injury are noted. The fungus works only when abundant moisture is present. When the floor was removed and ventilated no further injury was noticed a year after the precautions were instituted.—*Henry Dorsey.*

2037. Cunningham, G. H. **Fire-blight.** New Zealand Jour. Agric. **21**: 137–139. 1920.—Notes concerning the disease, the causal organism [*Bacillus amylovorus*], and the effects of the disease as it occurs in New Zealand.—*N. J. Giddings.*

2038. Foëx. **Quelques causes de degenerescense chez la pomme de terre. [Some causes of degeneracy of potatoes.]** Jour. Soc. Nation. Hort. France **21**: 204–207. 1920.—Leaf roll and mosaic assigned as causes of degeneracy of potatoes. Symptoms of these two diseases are briefly described and contrasted. Methods of control such as use of seed from fields free from the diseases and breeding for resistance are recommended.—*H. C. Thompson.*

2039. Gough, Geo C. **Wart disease of potatoes.** Jour. Roy. Hort. Soc. **45**: 301–312. 1919.—The fungus causing this disease (*Synchytrium endobioticum*) is thought to have been introduced within the last sixty years, yet it may possibly be indigenous. The disease may be spread by infected seed, tools and implements, and by feeding diseased materials to animals. It is found in every county in England except Suffolk and Cornwall and is obviously spreading, imperiling the future of the potato industry. The use of immune varieties gives some promise of control. A bibliography of ninety numbers is appended.—*J. K. Shaw.*

2040. Gregory, C. T. **Heterosporium leafspot of timothy.** Phytopath. **9**: 576–580. 1919.—A description of a leafspot disease of timothy caused by *Heterosporium phlei* n. sp.—*J. G. Dickson.*

2041. Harter, L. L., and J. L. Weimer. **The surface rot of sweet potatoes.** Phytopath. **9**: 465–470. *1 pl.* 1919.—The writers describe a surface rot due to a species of *Fusarium* identical morphologically with *Fusarium oxysporum.* Control measures are discussed.—*J. G. Dickson.*

2042. Landi, Raffaele. **Tumori o galle del colletto e delle radici delle piante fruttifere (Crown-Gall). [Crown-gall of fruit trees.]** Rev. Patol. Veg. **10**: 87–96. *Pl. 1–4.* 1920.—Crown-gall caused by *Bacillus tumefaciens* is described as widespread in Italy on a variety of plants, the peach being injured most severely, next the almond tree, the apricot less, and the walnut rarely. An organism was isolated which in agar cultures at 32°C. produced small, round, whitish colonies. Similar bacteria were isolated from the galls on the different host plants. Literature referring to this disease in Italy is given.—*F. M. Blodgett.*

2043. Link, G. K., and Max W. Gardner. **Market pathology and market diseases of vegetables.** Phytopath. 9: 497–520. 1919.—A summary of the results of the first year's study of the market pathology of truck crops, carried on in coordination with the Food Products Inspection Service of the Bureau of Markets of the United States Department of Agriculture. Following a listing of typical losses which came to their attention, the authors group the market diseases into two classes. The first comprises the more or less specific and clearly defined diseases, the causal organisms of which have rather narrow host limitations. The second class comprises the diseases not commonly recognized as of importance in the field, the causal organisms of which apparently are not narrowly limited as to host range and do not manifest a high degree of parasitism as based upon virulence under field conditions. A list of important market diseases arranged according to hosts is given.—*J. G. Dickson.*

2044. McCubbin, W. A. **The brown rot of stone fruits.** Bull. Pennsylvania Dept. Agric. 3[9]: 1–8. *1 pl., 1 fig.* 1920.—In a popular account, brown rot is estimated to cause 15 per cent loss annually in Pennsylvania peaches (crop estimated at 1,000,000 bushels). Because of this disease the transportation problems are more difficult, prices are reduced, picking and marketing are rushed to prevent excessive loss. Sanitation in the orchard, pruning and thinning, clean cultivation and spraying are recommended as field methods for brown rot control. Cooling of the fruit after picking retards loss in marketing.—*C. R. Orton.*

2045. Molz, E. **Die Typhula-Fäule der Zuckerrüben auf den Azoren und ihre Bekämpfung. [Typhula rot of sugar beets in the Azores and its control.]** Zeitschr. Pflanzenkrankh. 30: 121–139. *Fig. 1–7.* 1920.—*Typhula betae* Rostr. causes a destructive rot of sugar beets in the Azores. By means of cultural studies of the causal agent and from field study, author concludes that excessively moist atmosphere favors the parasite. The disease follows injury from the larvae of *Agrotis segetum*, the control of which would also have a beneficial effect on the control of the rot.—*H. T. Güssow.*

2046. Piper, C. V., and H. S. Coe. **Rhizoctonia in lawns and pastures.** Phytopath. 9: 89–92. *2 pl.* 1919.—The authors describe a disease of the common lawn and pasture plants caused by *Rhizoctonia solani* which results in formation of extensive brown or dead areas in the turf. The disease has been found in several states and is thought to be of general occurrence in lawns and pastures throughout the eastern quarter of the United States. Inoculations in laboratory and field were made to confirm the diagnosis. Disinfection with Bordeaux mixture gave only temporary control; other chemicals (mercuric chloride, sulphur, iron sulphate) were unsatisfactory. Tests with strains of *Agrostis canina* and *Agrostis stolonifera* showed among several very susceptible strains, certain strains of each which were resistant.—*G. H. Coons.*

2047. Sorauer, Paul. **Manual of plant diseases. I. Non-parasitic diseases.** English translation by Frances Dorrance. *26 x 18 cm., 888 p., 208 fig.* Printed privately: Wilkes-Barre, 1914–1920.—A translation without deviation from the original.—*D. Reddick.*

2048. Vaughan, R. E., and J. C. Walker. **Onion smut.** Wisconsin Agric. Exp. Sta. Circ. 114. 1919.—Formaldehyde solution (1 ounce to 1 gallon) applied at the rate of 200 gallons per acre controls onion smut when applied to the soil with the seed by using a drip attachment on the seeder.—*R. E. Vaughan.*

2049. Zimmerman, Hans. **Nematodenbefall (Heterodera) an Kartoffeln. [Nematodes (Heterodera) on potatoes.]** Zeitschr. Pflanzenkrankh. 30: 139–145. *4 fig.* 1920.—In Mecklenburg an attack due to nematodes was observed first in 1913. In recent years this trouble has become of more importance in the same locality. Following a description of the course of the disease, such as "rolling of leaves," "drooping, followed by death," author suggests control measures such as rotation, omitting potatoes on infected land for three years, disease free seed, and other methods of sanitation.—*H. T. Güssow.*

ERADICATION AND CONTROL

2050. Barthe, A. E. **Lucha antiparasitaria.** [Parasite control.] Rev. Agric. Com. y Trab. 3: 256–265. *5 fig.* 1920.—A general review of the classes of insect and plant parasites is given with a resumé of different spray materials, machinery, and other control measures.—*F. M. Blodgett.*

2051. Brooks, F. T. **Plant sanitation in fruit plantations.** Trans. British Mycol. Soc. 6: 253–262. 1920.—Diseased parts of trees and shrubs in or near fruit plantations should be promptly cut off and burned to prevent spread of disease. When a tree is dying back to such an extent that it has to be cut down it is important that the stump be either removed or covered with soil to prevent the development of dangerous fungi. Other suggestions for destroying breeding places of destructive fungi and insects are given.—*W. B. McDougall.*

2052. Butler, O., and T. O. Smith. **Relative adhesiveness of the copper fungicides** Phytopath. 9: 431–444. 1919.—Following a review and tabulation of previous work on the adhesiveness of Bordeaux mixture, the authors tested various types of Bordeaux and Burgundy mixtures for adhesiveness. Relative adhesiveness was determined by use of sprayed leaves of Coleus golden bedder on which the spray was allowed to dry. Half leaf samples were then taken, after which the plants were subjected to rain conditions. Plants were then dried and further samples taken for analysis. Copper was determined by the electrolytic method. The authors find that neutral and alkaline Burgundy mixtures are more adhesive than Bordeaux mixtures, and that the alkaline Burgundy mixture is more adhesive than the neutral wash. The adhesiveness of the Bordeaux mixtures decreases with increase in percentage of lime. Within the temperature limits 10 and 30°C., adhesiveness of Bordeaux mixture varies inversely with the degree of deterioration rather than being dependent on the degree of hydration. Deteriorated Bordeaux mixture, having copper sulphate-lime ratio 1:1, is more adhesive than deteriorated Burgundy mixture, probably due to the lime present in the former. The addition of ferrous sulphate decreases adhesiveness of Bordeaux mixture, the addition of Paris green or arsenite of soda does not materially change adhesiveness, and the addition of lead arsenate increases adhesiveness. Casein does not affect adhesiveness of 1:1 Bordeaux mixture. Copper acetates are more adhesive than Bordeaux mixture. The addition of gelatin to normal and basic acetate of copper increases the adhesiveness of these salts. Cuprammonium sulphate is very much more adhesive than Johnson's mixture. "Pyrox" is inferior in adhesiveness to its equivalent 1 per cent Bordeaux 1:1 plus 0.5 per cent arsenate of lead. Climatic conditions prevailing at the time the fungicide is applied affect the adhesive properties of the wash.—*G. H. Coons.*

2053. Childs, L. **Spray gun versus rod and dust in apple orchard pest control.** Oregon Agric. Exp. Sta. Bull. 171. *46 p., fig. 1–17.* 1920.—The dusting method has been found to control scab and codling-moth in the Hood River Valley, but present known dust materials will not effectively control anthracnose, mildew, leaf-roller, and the various apple aphids. Applications made with a rod are most expensive. Sprays applied with one gun, using a 3½ horse-power machine, are least expensive, although the saving in time resulting from the use of a big machine, together with the fact that a perfect spray is produced with no overload to the machine, makes a big sprayer much more economical and efficient.—*E. J. Kraus.*

2054. Howard, W. L. **Circumventing the pear blight.** Monthly Bull. Dept. Agric. California 8: 603–604. 1919.—Bench grafting of Surprise scions upon Japanese seedling pear roots is recommended. By using a long scion and a comparatively short root, the scion may be made to form roots of its own. The Surprise tree on the Japanese root is allowed to grow until desired shape is obtained by pruning during the first two years. The main branches may then be grafted to Bartlett. It is thus impossible for blight to kill more than the branches, which, if attacked, can be cut off and the stumps grafted the next spring.—*E. L. Overholser.*

2055. Hyde, W. C. **Orchard experiments in Stoke district.** New Zealand Jour. Agric. 21: 81–83. 1920.—Experiments for control of peach brown rot, apple leaf hopper, and apple black spot (scab). Four types of spray materials were tested, and several varieties of fruit were included in some of the experiments. Some general conclusions are given.—*N. J. Giddings.*

2056. Lovett, A. L. **Insecticide investigations.** Oregon Agric. Exp. Sta. Bull. 169. *55 p., fig. 1–12.* 1920.—The use of spreaders in conjunction with many poison sprays increases adhesiveness, causing a more even coating of the surface to which they are applied. Arranged in order of commercial desirability some of these spreaders are "caseinate" (a mixture of casein, hydrated lime and water to form a thin paste), gelatin, glue, Irish moss, and soap bark. While miscible oil emulsion may prove a very valuable spreader, it is not definitely recommended at this time. Other substances, such as cane sugar, glycerine, tea made from sage-brush, and gum arabic were also used but with indifferent success. Tests on the use of materials with arsenate sprays to render them non-injurious to foliage, and on the action of nicotine sulphate sprays are reported.—*E. J. Kraus.*

2057. McMurran, S. M. **Pecan rosette in relation to soil deficiencies.** Amer. Nut Jour. 10: 38–39, 43. 1919.—Pecan rosette is the most serious trouble to which pecan trees are subject. Earliest stages of disease are indicated by a few small, wrinkled, yellow-mottled leaves at end of branches. Trees are so weakened that they are often killed by winter injury or borer attacks, though they do not die as a direct result of the disease. Deficiency in humus and soil moisture is given as the cause of the disease. Cover crops, especially legumes, are recommended as a remedy. Deep sands and eroded hillsides should be avoided.—*E. L. Overholser.*

2058. McMurran, S. M. **Preventing wood rot in trees.** Amer. Nut Jour. 10: 40–41. 1919.—Wood-rotting fungi gain entrance through unprotected wounds on trees and are ultimately the cause of serious losses. In top working, stubs should not be left and sloping cuts should be avoided. Wounds should be covered with waterproof material until healed. The long growing seasons and hot, humid climatic conditions of the southern states are very favorable for development of wood-rotting fungi.—*E. L. Overholser.*

2059. Pritchard, F. J., and W. B. Clark. **Effect of copper soap and of Bordeaux soap spray mixtures on tomato leaf spot.** Phytopath. 9: 554–564. *7 fig.* 1919.—Experiments, based chiefly upon the yield of fruit, are reported in tabular form on the use of different spray materials in controlling leaf spot. The cheap copper soap mixture 0.5–0–3–50 increased the yield as much as Bordeaux. It was not so effective as Bordeaux soap 4–2–3–50 or Bordeaux mixture 4–4–50 in controlling the disease on the foliage under field conditions; but as it increased in yield fully as much as the others it was the most economical of the three spray mixtures.—*J. G. Dickson.*

2060. Simonetto, M. **Criterios sobre la destrucción de plagas y de las enfermedades en general de las plantas y de la mosca prieta en particular. [The destruction of plagues and diseases of plants in general and of the fly (Aleurocanthus Wóglumi) in particular.]** Rev. Agric. Com. y Trab. 3: 164–169. *1 fig.* 1920.

2061. Walton, R. C. **The control of frog-eye on apple.** Pennsylvania Agric. Exp. Sta. Bull. 162. *39 p., 18 fig.* 1920.—Frog-eye, caused by *Physalospora cydoniae*, often causes almost complete defoliation by August in certain parts of Pennsylvania. This results in undersized fruit, loss of vitality, weakened fruit buds, and eventually death of the trees unless protection is afforded.—The reported experiments were conducted upon York Imperial and Stayman Winesap trees in three different orchards during the years 1918 and 1919. Bordeaux mixture, lime-sulphur, "Pyrox," "Sulfocide," and sulphur dust were used. By means of extensive bagging experiments it was found that more than half of the total infection takes place within the period of eighteen days after the petals fall. This is appar-

ently the period of greatest foliage susceptibility of the host. The relations of temperature and precipitation to frog-eye infection are discussed in some detail.—Of the protective materials used, Bordeaux mixture, lime-sulphur, and "Pyrox" proved the most effective in the order named. Bordeaux mixture reduced the infection in per cent to 19.8; lime-sulphur to 21.5; "Pyrox" to 28.5; "Sulfocide" to 65.8; while sulphur dust gave no control. The average infection on all the checks was 79.4 per cent. For the optimum control the fungicide should be applied (1) just before the blossom buds open, (2) when three-fourths of the petals have fallen, (3) two weeks later, (4) about the middle of June. The last application is not necessary for commercial protection. Pruning and the destruction of dead twigs and limbs are regarded as important accessories to spraying.—*C. R. Orton.*

MISCELLANEOUS (COGNATE RESEARCHES, TECHNIQUE)

2062. Anonymous. **Proceedings of the twelfth annual meeting of the American Association for Cancer Research.** Absts. Bact. **4:** 221–223. 1920.—Contains abstracts of the papers presented.—*D. Reddick.*

2063. Chapman, G. H. **"Crack-neck:" A non-parasitic disease of chrysanthemums.** Phytopath. **9:** 532–534. *1 pl.* 1919.—A description is given of a non-parasitic malady occurring in fancy forced chrysanthemums, with suggested control measures.—*J. G. Dickson.*

2064. Davis, D. M., and E. O. Swartz. **The testing of germicidal substances against the gonococcus.** Jour. Infect. Diseases **27:** 591–601. 1920.—A new method for making germicidal tests with the gonococcus is presented. It consists in mixing in sterile centrifuge tubes 1 cc. of the gonococcus emulsion with 1 cc. of the properly diluted drug to be tested, incubating for 20 minutes in a water bath at 37.5°C., centrifuging, washing with 0.85 per cent NaCl solution, centrifuging again, and finally inoculating liberally, and with a special loop, the washed gonococci upon the surface of ascitic—or hydrocele—fluid agar. If the tubes show no growth at the end of 7 days they are reinoculated with a fresh, viable culture of gonococcus, to prove whether or not enough of the test drug was carried over with the transfer to make the medium unsuitable for growth.—*Selman A. Waksman.*

2065. Davis, Lewis. **Some important factors in the preparation of culture media.** Amer. Jour. Public Health **10:** 250–254. 1920.—The preparation of culture media is discussed with special reference to the needs of the commoner pathogenic organisms. The importance of peptone is stressed. Its value is dependent on the amount of amino acids and other compounds present in a form utilizable by bacteria. A peptone hydrolyzed to a much greater degree than the one formerly imported has increased nutritive values. Beef infusion is superior to beef extract for the cultivation of pathogenic bacteria, and especially for the production of toxins. The presence of a small quantity of fat in the infusion, however, has a deleterious action, due, probably, to a depression in the surface tension of the medium. Hydrogen-ion concentration is discussed and a general procedure for adjusting it by the colorimetric method is outlined. The steam pressure method of sterilization is favored, but media having a supernatant layer of oil for production of anaerobiosis are perfectly sterilized by the intermittent method.—*C. A. Ludwig.*

2066. Hartley, Carl, Roy G. Pierce, and Glenn G. Hahn. **Moulding of snow-smothered nursery stock.** Phytopath. **9:** 521–531. 1919.—The authors describe a mulch injury or snow mould of evergreen nursery stock, the disease also occurring to a less extent on young trees in the forest. The disease can be distinguished by the fact that following the snow or mulch injury, the roots remain healthy for a considerable time. Control measures are suggested.—*J. G. Dickson.*

2067. Jones, L. R., and M. Miller. **Frost necrosis of tulip leaves.** Phytopath. **9:** 475–476. *1 fig.* 1919.

2068. Miller, David. **Leaf-stem gall-aphis of the poplar.** New Zealand Jour. Agric. **21**: 134–135. 1920.—The occurrence of this insect (*Pemphigus populitransversus*) in Central Otago, N. Z., is recorded. The leaf and the root forms were found and life history observations show the habits to be essentially the same as in North America.—*N. J. Giddings.*

2069. Peyronel, Beniamino. **Alcuni casi di rapporti micorizici tra Boletinee ed essenze arboree.** [**Some mycorhizal relations between Boletineae and woody plants.**] Staz. Sperim. Agrarie Ital. **53**: 24–31. 1920.—A short contribution to the study of ectotrophic mycorhizae. Mycorhizal relations were observed between *Larix decidua* and *Boletus elegans*, *B. laricinus*, and *Boletinus claviceps*, and between *Populus tremula* and *Boletus rufus*, by following the mycelial strands through the soil from the fruiting body of the fungus to the root of the higher plant and also by microscopical examination. An extensive literature list is appended. —*A. Bonazzi.*

2070. Stevens, Neil E., and A. H. Chivers. **Fanning strawberries in relation to keeping quality.** Phytopath. **9**: 547–553. 1919.—The authors find that fanning berries after picking, although partially drying the surface and lowering the temperature from 1 to 2°C., does not add appreciably to their keeping quality. The average quantity of sound berries at the end of the storage period in 1919 was 50 per cent for the fanned and 53 per cent for the unfanned. Temperature appears to be the important factor in shipping and storing soft fruits. Berries picked at 16 and 27°C. showed respectively 72 and 51 per cent sound berries. Brief discussion of the fungi causing decaying of ripe berries is given.—*J. G. Dickson.*

2071. Stokes, William Royal, and C. H. Douthirt. **Practical disinfection of tuberculous sputum.** Amer. Jour. Public Health **10**: 973–975. 1920.—The authors cite some experiments which show that prompt effective disinfection of tuberculous sputum depends upon dissolving the matrix of sputum to permit the disinfectant to reach the bacteria.—*C. A. Ludwig.*

2072. Stone, R. E. **Kerosene injury to shade trees.** Phytopath. **9**: 476–477. 1919.

2073. Tilley, F. W. **Investigations of the germicidal value of some of the chlorin disinfectants.** Jour. Agric. Res. **20**: 85–110. 1920.—Presentation from the standpoint of general disinfection in animal industry.—"In the present work, considered as a whole, there is seen throughout more or less 'selective action' on the part of the various disinfectants. The most clearly defined example of this is seen in the extremely high value of chloramin T against *Staphylococcus aureus* as compared with its extremely low value against *Bacillus pyocyaneus*."—"The results of the experiments upon anthrax spores show that the germicidal action of chlorin compounds is not always so speedy as is commonly supposed but may extend over several days."—"The addition of ammonia to solutions of chlorin or hypochlorites very greatly increases germicidal activity and tends to prevent depreciation in value on the addition of organic matter."—*D. Reddick.*

2074. Vaughan, R. E., and M. Miller. **Freezing injuries to potato tubers.** Wisconsin Agric. Exp. Sta. Circ. 120. 1919.—Popular discussion of frost necrosis.—*R. E. Vaughan.*

PHARMACEUTICAL BOTANY AND PHARMACOGNOSY

H. W. Youngken, *Editor*
E. N. Gathercoal, *Assistant Editor*

2075. Anonymous. **Agar production in U. S.** Spatula **26**: 446. 1920.—The production of agar from seaweeds, very abundant along the lower California coast, by modern machinery and methods is now carried on at Glendale near Los Angeles. The production reaches 700 pounds per day. The imports from Japan in 1919 were approximately 250 tons. The use of agar in bacteriology, medicine, and food preparations is constantly increasing.—*E. N. Gathercoal.*

2076. Anonymous. **Annual Report, Cinchona Department, Madras. 1918–19.** Through Chem. and Druggist **93**: 1345. 1920.—Acreage has increased during the year from 1184 to 1348 acres fully stocked with trees. Factory has worked up 707,000 pounds of bark, viz., 12,800 pounds of Java-grown *C. ledgeriana*, 408,520 pounds locally purchased *C. officinalis*, and 285,870 pounds government bark, producing 39,633 pounds of alkaloids. The average analysis was 3.66 per cent of quinine sulphate against 4.59 per cent the previous year. As the supplies from private plantations are decreasing and the government bark does not nearly meet the demand for quinine an urgent appeal is made for extensive new government plantations that India may not be at the mercy of foreign growers in Java.—*E. N. Gathercoal.*

2077. Anonymous. **Camphor cultivation and substitutes.** Chem. and Druggist **93**: 1514. 1920.—The camphor tree, *Cinnamomum Camphora*, is now cultivated in California, Florida, Texas, Manila, Malay States, and Mauritius. In California, *Ramona stachyoides*, *Artemisia trifolium*, and *A. frigida* are being cultivated for camphor. The volatile oil of *Ramona stachyoides* contains about 40 per cent of camphor.—*E. N. Gathercoal.*

2078. Anonymous. **Indian industries V—The Mowra tree.** Chem. and Druggist **93**: 1410. 1920.—A very valuable economic tree of India is the mowra, *Bassia longifolia*. The flowers are used by millions of people as a food. The seeds furnish an abundant oil, suitable for domestic use and soap manufacture, and are of medicinal value in certain skin diseases. The wood is extensively used for building, turnery and furniture. Because of the complete collection of the seed to supply the local and export demand the number of mowra trees, while very great, is constantly decreasing and an appeal is made for extensive government plantings in the government reserve forests. The seedlings develop rapidly even on stony soil and need only protection from grazing cattle.—*E. N. Gathercoal.*

2079. Anonymous. **The supplement to the French Codex.** Pharm. Jour. **105**: 301–302. 1920.—Serum Antidysenteric and Serum Antimeningococcic as well as a number of chemicals and gelenicals have been added. Of asafoetida, the permissible residue upon incineration has been raised from 10 to 20 per cent. Balsam of Peru is required to contain by assay from 52 to 56 per cent of cinnamein. Strophanthus in the Codex consisted of the seeds of *S. hispidus* only; now those of *S. Kombe* may also be used and are described.—*E. N. Gathercoal.*

2080. Anonymous. **Les vegetaux aromatiques de Madagascar. [Aromatic plants of Madagascar.]** Schweiz. Apotheker Zeitg. **58**: 501–503. 1920.—A brief account is given of the status of the production in Madagascar of Ylang-ylang, Geranium, Clove, Vanilla, Canella, Champaca, Eucalyptus, Pepper, Allspice, Nutmeg. Vanilla is the chief product exported from the island.—*H. W. Youngken.*

2081. Atkinson, Esmond H. **Weeds and their identification.** New Zealand Jour. Agric. **21**: 115–119. *1 pl.* 1920.—Poison hemlock, *Conium maculatum*, is reported as occurring in various localities. The plant is described in detail. Plants of similar appearance are also mentioned and differential characters are given. The poisonous effects are described.—*N. J. Giddings.*

2082. Barger, George. **Ergot: its history and chemistry.** Pharm. Jour. **105**: 470–473. 1920.—A very complete résumé of the history of ergotism and epidemics caused by ergot, of the medicinal properties of ergot, and of its botanical and chemical history. The chief active principles of ergot are: (a) the amorphous alkaloid ergotoxine, yielding crystalline salts. Physiologically this alkaloid causes such contraction of the arterioles that the blood supply to an organ may in the long run be cut off completely, causing gangrene. Also, it acts on the nervous system producing convulsions. (b) Histamine—a powerful uterine stimulant. (c) Tyramine—the chief blood pressure raising principle. (d) Acetycholine occurs in ergot and ergot extracts in variable and usually negligible amounts. It lowers blood pressure. A large number of physiologically inert substances, alkaloidal, acid, resinous, and oily in nature, are also isolated from ergot.—*E. N. Gathercoal.*

2083. Bruce, E. A. **Hydrangea poisoning.** Jour. Amer. Vet. Med. Assoc. **58**: 313–315. 1920.—An account is given of the poisoning of a horse from eating *Hydrangea hortensis* var. *otaska*. Experiments with guinea pigs were interpreted as proving the poisonous properties of the plant.—*C. D. Marsh.*

2084. Cabrera, Teodoro. **El cordobán y sus aplicaciones medicinales. [Rhoeo and its medical uses.]** Rev. Agric. Com. y Trab. **3**: 170–171. *2 fig.* 1920.—*Rhoeo discolor* is described and is said to be useful as a haemostatic and as a pectoral. Several cases of its successful use for the second purpose are described.—*F. M. Blodgett.*

2085. Casparis, P. **Über einige Volksheilmittel Turkestans. [On some popular medicaments of Turkestan.]** Schweiz. Apotheker Zeitg. **58**: 497–501, 512–514. *1 fig.* 1920.—The author discusses 21 popular medicaments, samples of which were collected by Dr. Wacker in Turkestan during the world war. These include the fruits of *Helicteres Isora* L. (Fam. Sterculiaceæ), known in Turkestan as "Machmil i Tetschon" and employed in the treatment of diarrhoea and articular disease; the unripe inflorescence of *Piper longum*, known as "Dari Pelpel" and used for headaches; star anise, known as "Badian Kuttaie;" Coriander fruits, which are smoked for headache; Nux Vomica seeds, known as "Gargemorit" or "Kutschilla," employed in the treatment of backache; Myrobalans from *Terminalia Chebula* Retz Combretaceæ), known as "Chaliletsch asfar," which is crushed, boiled, and drunk with tea and sugar for anaemia; the unripe fruit of *Myrobalani nigra* var. *indica*, known as "Chaliletsch Kara" and used as the preceding; the seeds of a *Sisymbrium*, probably *Sisymbrium Sophia*, natively called "Chabba" and purgativ in action; the seeds of *Entada scandens*, which are eaten with sugar for backache and known to the natives as "Kurri Katar;" the galls and fruits of a *Pistacia* used for stomachache; Aleppo Galls, known as "Apas" and "Masi" and smoked with tobacco by the natives for headache and pain in the eyes; the blue flowers and verticillasters of an *Echium*, employed in heartburn and fever; Mecca Senna leaves, known as "Semeh Mekeh," which are boiled with milk as a purgative; an inferior variety of Tragacanth, called "Katira," which is crushed and soft-boiled as a probable remedy for headache; Gum Arabic, known as "Samgh i arabi," is dissolved in hot water as eye drops; an inferior grade of Hashish called "Nascha" is smoked or eaten as a narcotic; sticks of red bolus, which Dragendorff mentions as "Tillae armani" and "Gul armani," are employed in the treatment of diseases of the oral cavity; a fine red crystalline powder called "Schingab" is applied externally in the treatment of child rash; a globular, brownish-red structure, about 4 cm. in diameter and consisting of a mixture of fennel, the fruits of an *Apium* species, and *Trachyspermum copticum* L., is powdered and taken with milk as a sedative; a coarse brownish powder mixed with numerous whitish particles and consisting of powdered *Veratrum* rhizome and powdered cloves, is employed as a snuff for headache.—*H. W. Youngken.*

2086. Coates, U. Aylmer. **Poke root in medicine.** Pharm. Jour. **105**: 454. 1920.—A review of the therapeutic values and medicinal uses of the fruit and root of *Phytolacca decandra* from the literature of the last century.—*E. N. Gathercoal.*

2087. Couch, James F., and Leigh T. Giltner. **An experimental study of Echinacea therapy.** Jour. Agric. Res. **20**: 63–84. 1920.—Various preparations of *Echinacea*, the "specific medicine echinacea," the fluid extract, and "subculoyd inula and echinacea," were studied as remedies in several types of infections and allied diseases, both acute and chronic, in guinea pigs. The material was not effective in the case of botulism, tetanus, septicemia, rattlesnake venom, tuberculosis, and trypanosomiasis.—Definite evidence of organic effects from the echinacea itself was not obtained.—*D. Reddick.*

2088. Clark, A. Wayne, R. O. Smith, and Leroy Forman. **Purity standards for absorbent cotton.** Jour. Amer. Pharm. Assoc. **9**: 958–965. 1920.—A report of the work on extraction methods for impurities in absorbent cotton. Authors find themselves unable to formulate a satisfactory method for testing for the degree of absorbency which will express the

results in a scientific way. As the U. S. Pharm. IX does not contain a water extraction test, authors suggest that one be included in the forthcoming revision. The weight of the residue obtained, as per method given, should not exceed 0.25 per cent. Authors see no value in or need for an alcohol extraction, as the water and ether extractions suffice. In a comparison of the Soxhlet, U. S. Pharm., and the Aliquot methods for ether extract, practically all ether-soluble material was obtained by the first method in six hours. The U. S. Pharm. method gave about 40 per cent and the Aliquot method about 50 per cent. Suggested standard requirements for absorbent cotton for the forthcoming revision of the U. S. Pharm. are given.—*Anton Hogstad, Jr.*

2089. Eberle, E. G. **World trade, production and consumption of crude botanical drugs.** Jour. Amer. Pharm. Assoc. **9**: 947. 1920.—An editorial discussion of a recent report of the U. S. Tariff Commission, in which the probable future of American drug cultivation and, in connection therewith, the world trade, production, and consumption of crude botanical drugs are considered. Author quotes various portions of the report referring to the American crude drug industry in which it is recommended that the American industry be aided and consideration given to the advisability of promoting and continuing cultivation of the indispensable drugs which have been successfully produced under American climate, labor, and economic conditions.—*Anton Hogstad, Jr.*

2090. Eckler, Charles R. **A contribution to the pharmacology of cotton root bark.** Lilly Sci. Bull. **1**: 349–368. *3 pl.* 1920.—Animal tests were made on several commercial samples of green and dried cotton root bark, and on the bark of thirteen different varieties of cotton. These tests were made in comparison with ergot and pituitary extract. Several different animal tests were used, including the cock's comb method, blood pressure determinations, and the isolated and intact uterus methods. The conclusions reached were that the physiological activity of cotton root bark was not comparable to that possessed by ergot.—*Fred A. Miller.*

2091. Glover, Geo. H. **Plant poisoning.** Amer. Jour. Vet. Med. **15**: 315–316, 338. 1920.—An address delivered before the Missouri Valley Veterinary Association covering in a general way the conditions under which the poisoning of livestock takes place.—*C. D. Marsh.*

2092. Greenish, Henry G. **Uzara: what is it?** Pharm. Jour. **105**: 474–475. 1920.—A new remedy useful for dysentery and diarrhoea, originally obtained from native medicine-men of the Lake district of equatorial Africa. It is the root probably of a species of the Asclepiadaceae, a shrub with long thin twigs and long narrow leaves in pairs. The root is large and woody, somewhat aromatic and very bitter. It is exhausted with 10 per cent alcohol. A number of active principles have been isolated. To one is attributed a soothing action on the intestine; one or several others act on the circulation and on the nerve-system. Intravenous injections of small doses produce a rise in blood pressure similar to the action of adrenalin. The Biological-Agricultural Institute in Amani submitted herbarium material and root samples of a drug, used by the Kaffirs for colic, which was identified as *Dicoma anomala* of the Compositae. It is questionable whether this plant is the true source of uzara.—*E. N. Gathercoal.*

2093. Holmes, E. M. **On the use of poke root in medicine.** Pharm. Jour. **105**: 417. 1920.—That *Phytolacca decandra* possesses active properties there can be no doubt. Its physiological action and its chemical constituents seem worthy of careful investigation, especially the saponin, which may possess haemolytic activity. The drug appears to be especially valuable in resolving tumors of the breast. The fresh root, undried, is the most active, and is applied externally over the tumor and kept wet with the tincture until well-developed pustular sores are formed. Several cases of tumor and cancer of the breast as also of epithelioma are cited in which tumor resolution with complete cure has resulted.—*E. N. Gathercoal.*

2094. Hommel, Philemon E. **The lemon.** Practical Druggist 38^{11}: 20–21. 1920.—An account of the history, structure, constituents and medicinal uses of the lemon.—*Wm. B. Day.*

2095. Jermstad, Alex. **Sur la determination de la teneur de l'opium en morphine. [On the determination of the strength of opium in morphine.]** Repertoire Pharm. **32**: 257–262. 1920.—All methods may be grouped under six headings, viz: (1) Alcohol; (2) water (Helfenberg's); (3) lime; (4) precipitation and reduction; (5) polarimeter; (6) other methods. Method 3 is employed by the French, English, Dutch, Japanese, Spanish, and American Pharmacopoeias. The author proposes a modification of Helfenberg's method which has the following advantages: (1) Use of equal quantities of opium and reagents; (2) methyl-red is exact and active as an indicator; (3) no acetic ether; (4) no results rendered inexact by alkalinity of water; (5) possibility of combining the determination of morphine with that of the extract of opium.—*Heber W. Youngken.*

2096. Kilmer, F. B., and Ralph O. Smith. **Belladonna cultivation in a practical way.** Amer. Jour. Pharm. **92**: 620–630. *7 pl.* 1920.—A brief summary of the results obtained in the cultivation of belladonna at the Johnson & Johnson belladonna farm, since 1900. Authors discuss climatic and soil conditions, methods of cultivation, harvesting, yield, and cultural experiments.—No successful cultivation, as far as the authors are aware, has been made on this continent by sowing seed in open ground. At least two crops of leaves can be harvested from first year plants; from second and third year plants two to four cuttings are usual. The yield of leaves and stems is greatest from second and third year plants. The yield per 1000 plants was as follows: Second year plants—herb 1177 pounds, alkaloid 0.891 pound; first year seedlings (potted plants)—herb 527 pounds, alkaloid 0.313 pound; first year seedlings (cold frame plants)—herb 534 pounds, alkaloid 0.289 pound.—Authors also submit data to the effect that the tops of belladonna, including stems, fully meet the requirements of the U. S. P.; they see no reason why belladonna herb, especially that obtained from cultivated plants, should not be admitted to the Pharmacopoeia under proper restrictions as to alkaloidal content, etc.—*Anton Hogstad, Jr.*

2097. King, E. D., Jr. **Poisonous plants of the south.** Jour. Amer. Vet. Med. Assoc. **57**: 302–313. 1920.—This is a list of plants with brief remarks regarding properties, and treatment of poisoned animals.—*C. D. Marsh.*

2098. Micheletti. **Piedmontese peppermint oil.** [From La Parfumerie Moderne Oct. 1920.] Chem. & Druggist **93**: 1507. 1920.—Peppermint oil distilled from Mitcham peppermint, cultivated about Vigone and Pancalieri and in the province of Turin, is of exceptional quality on account of the delicacy of its perfume and sweetness of its aroma. Over 25,000 kilos are produced annually.—*E. N. Gathercoal.*

2099. Pammel, L. H. **Alsike clover poisoning.** Amer. Jour. Vet. Med. **15**: 437–438. 1920.—A description of some cases of poisoned horses with an account of the symptoms exhibited.—*C. D. Marsh.*

2100. Pammel, L. H. **Castor seeds poisonous.** Amer. Jour. Vet. Med. **15**: 171–172. 1920. —The author quotes E. White, apparently from a letter, who gives a detailed account of the poisoning of horses by castor beans, with a description of the symptoms, post-mortem findings, and treatment.—*C. D. Marsh.*

2101. Pammel, L. H. **European morning-glory suspected of being poisonous.** Amer. Jour. Vet. Med. **15**: 439. 1920.—This is an account of a sick horse which possibly had been poisoned by *Convolvulus arvensis.*—*C. D. Marsh.*

2102. Pammel, L. H. **Is the dogwood poisonous?** Amer. Jour. Vet. Med. **15**: 66. 1920.—The author in reply to a query about the poisonous properties of *Cornus asperifolia* expresses his opinion that it is not toxic.—*C. D. Marsh.*

2103. Pammel, L. H. **Ground cherry leaves supposed to be poisonous.** Amer. Jour. Vet. Med. **14**: 606. 1919.—In reply to a query about *Physalis longifolia* it is stated that the green fruit and leaves are poisonous.—*C. D. Marsh.*

2104. Pammel, L. H. **Hogs poisoned by young cockleburs.** Amer. Jour. Vet. Med. **15:** 385–386. 1920.—This is an account of the deaths of some hogs, presumably from eating cocklebur, with remarks on cocklebur poisoning.—*C. D. Marsh.*

2105. Pammel, L. H. **Poisoning from silage and moulds.** Amer. Jour. Vet. Med. **14:** 605–606. 1919.—Attention is called to the fact that certain fungi are pathogenic and others produce toxic substances so that there is always danger in feeding moldy forage.—*C. D. Marsh.*

2106. Pammel, L. H. **Suspicious poisonous weeds.** Amer. Jour. Vet. Med. **15:** 384–385. 1920.—A brief account is given of *Lactuca canadensis*, *Oxybaphus nyctagineus*, and *Lactuca scariola.*—*C. D. Marsh.*

2107. Sheppard, Philip A. E. **African aboriginal therapy.** Amer. Jour. Public Health **10:** 227–235. 1920.

2108. Wallis, T. E. **Analytical microscopy, IX.** Pharm. Jour. **105:** 376–378. *Fig. 20–21.* 1920.—Microsublimation of active principles of plants and microchemical precipitations in plant cells are discussed.—*E. N. Gathercoal.*

2109. van der Wielen, P. **On the cultivation of Chenopodium ambrosioides anthelminticum.** [From Onze Tuinen Aug. 17, 1920.] Chem. & Druggist **93:** 1334. 1920.—The discovery in 1912 that the oil distilled from the seed of this plant was a most effective remedy in ankylostomiasis (hookworm disease), has resulted in a world-wide demand. The principal source has been from cultivation near Baltimore. Recently its cultivation in Delhi and elsewhere in the Dutch East Indies and in Holland has proven very successful. The oil produced appears to be fully equal to American oil.—*E. N. Gathercoal.*

2110. Wilmot, F. C., and G. W. Robertson. **Senecio disease.** [Taken from South African Med. Rec.] Jour. Amer. Med. Assoc. **75:** 1524. 1920.—In 1918 sickness of obscure causation, accompanied by abdominal pain and vomiting, occurred in the George district of Cape Province, South Africa. The disease was shown to be due to meal and bread containing the seeds and portions of the plants of *Senecio ilicifolius* and *Senecio burchelli*, weeds in the wheat fields of that vicinity.—*Wm. B. Day.*

2111. Youngken, H. W., and G. A. Slothower. **Rhus venenata DC.** Amer. Jour. Pharm. **92:** 695–701. *Fig. 1–4.* 1920.—A histological study of the stems and leaves of *Rhus venenata* with some observations on the poisonous constituent. The resin canals of the stem which extend from the bast region and penetrate the medullary region, where they end blindly, are narrow-branching vessels, filled with a dark, reddish-brown substance of a resinous nature. This resinous substance did not respond to the gummy lignin tests (Youngken) as applied to the stems of the Myricaceae. It did however, upon treatment with alcoholic potash, form a nigrescent compound, a reaction characteristic of the poisonous substance causing the dermatitis produced by the poisonous species of *Rhus.*—In the study of the leaf non-glandular, unicellular, and uniseriate hairs were noted in the dorsal region, many of which contained the resinous substance responding to the nigrescent reaction. Resin canals were noted in the vascular bundles but not in the mesophyll. To account for the presence of the resin in the hairs the authors are inclined to believe that it may be a direct product of the protoplasm. A series of successive extractions was made with petroleum ether, alcohol and water respectively. The poisonous principle was extracted with the petroleum ether. This extract applied to the inner forearm produced in 24 hours inflammation with violent itching and in 36 hours vesication.—*Anton Hogstad, Jr.*

PHYSIOLOGY

B. M. Duggar, *Editor*
C. W. Dodge, *Assistant Editor*

GENERAL

2112. Massart, Jean. **Éléments de biologie générale et de botanique. [Elements of general biology and botany.]** Vol. 1, Part I. *208 p., 188 fig.* Maurice Lamertin: Bruxelles, 1920.—The complete work will consist of 2 volumes aggregating 640 pages, with 500 figures. Volume I, Part I, contains General Biology and Part II, Protista. Volume II will consist of Part III, Metaphyta. (Protista include protozoans and protophytes.)—General Biology, here abstracted, is divided into three chapters: (I) Life and death, (II) the cell, (III) the factors in evolution. In Chapter I are presented the ten headings considered below: (1) *The forces active in organisms.* Herein is revealed one of the author's characteristic viewpoints. The opening sentence reads, "It has taken long centuries to rid biology of the prejudice that the activity of living things is different from that of inorganic nature." Bichat's definition, "Life is the ensemble of conditions which resists death," is given as representative of the viewpoint of naturalists up to about 1800, organisms being considered as showing a vital force not only distinct from, but directly opposed to, such forces as heat, gravitation, and light. Artificial synthesis of complex animal and vegetable substances, energy transformations in living things, and other considerations lead the author to state: "No vital force exists that does not resolve itself wholly into chemical and physical forces. . . . . Because most vital processes are too complex to be interpreted by us at present, is it a reason for hiding our ignorance behind the fallacious doctrine of a vital force?" Brief mention is made of the relative importance of heat, molecular forces, gravitation, light, chemical energy, electricity, magnetism, X-rays, and radioactivity. (2) *Biogenic elements.* The unique properties of the element carbon, which so admirably qualify it to be the essential constituent of all "living molecules," are discussed. (3) *The origin of life.* (4) *Conditions favorable to life.* Here are discussed: integrity of structure, temperature, osmotic pressure, manometric pressure, oxidizable substances and oxygen, environment unfavorable to life. (5) *Specificity of requirements.* (6) *Accommodation to temperature, water, osmotic pressure, nutrition, oxygen; influence on distribution.* (7) *Retarded activity and latent life.* (8) *Death.* (9) *The germinal line.* (10) *The loss of mortality.* (11) *The duration of life.*—Chapter II presents a consideration of the cell in four sections: (1) *Cell structure,* cell secretions, intercellular communications, cell evolution, relations between cell organs. (2) *Arrangement of cells.* (3) *Functions of the cell.* The last topic is discussed under three headings: (a) Molecular phenomena, intracellular pressure, turgescence and plasmolysis, osmotic pressure and growth, relation of ameboid movements to intercellular circulation and surface tension, hygroscopic movements. (b) Metabolism of the cell, cellular enzymes, production of energy, elimination of waste products. (c) Irritability. Protoplasm is considered as composed of more or less liquid colloids held in a reticulum of more or less solid colloids. Stimuli are treated in four sections: (a) The stimulus, sense organs, anaesthesia, nature of stimuli (internal or external); (b) conduction of stimulus; (c) the reaction (tonus, interferences, response); (d) duration and intensity of reflex periods. (4) *Genesis of cells,* including determination of sex.—In Chapter III, the discussion is carried out under four headings: (1) *Heredity.* (2) *Variability, fluctuation and mutation.* (3) *Selection.* (4) *Method in phylogeny.*—Throughout the discussions the mechanical, physical, and chemical aspects of vital phenomena are emphasized, and an abundance of illustrative material is drawn from unicellular forms and from higher plants and animals, the latter being frequently contrasted and compared. Experiments are described to illustrate important phenomena.—*Lee M. Hutchins.*

PROTOPLASM, MOTILITY

2113. Bolte, Elisabeth. **Über die Wirkung von Licht und Kohlensäure auf die Beweglichkeit grüner und farbloser Schwärmzellen. [The effect of light and carbonic acid on the motility of green and colorless swarm cells.]** Jahrb. Wiss. Bot. 59: 288–324. 1919.—An inves-

tigation of the tonic stimulation of various motile cells by light and carbon dioxide. The following were found to be negatively photokinetic in the sense in which Engelmann employed the term, that is, underwent light rigor when illuminated but continued for a relatively long period in darkness: 2 species of *Phacus*, 2 species of *Chlamydomonas*, and the zoospores of *Ulothrix subtilissima*. *Chlamydomonas variabilis*, *Carteria ovata*, *Euglena gracilis*, species of *Trachelomonas*, *Volvox aureus*, *Pandorina Morum*, *Eudorina elegans*, *Gonium pectorale*, and *Lepocinclis texta* were found to be positively photokinetic organisms, a category to which heretofore only the purple bacteria were known to belong. Light was found to be without influence upon the motility of *Euglena hyalinà*, *Chilomonas curvata*, *Menoidium incurvum*, *Polytoma uvella*, *Polytomella agilis*, and *Euglena proxima*. Some observations indicate that dark rigor is closely related to the cessation of photosynthesis, but in certain cases, as in that of *Chlamydomonas variabilis*, there seems to be no relation. No instance of change from positive to negative kinesis after long and intense illumination, such as was reported by Engelmann for the purple bacteria, was observed by the author. Of 19 photokinetic organisms 17 were found to be phototactic, and of 18 phototactic organisms 17 were photokinetic. In *Volvox aureus*, *Euglena gracilis*, *Trachelomonas*, *Eudorina elegans*, *Chlamydomonas*, *Pandorina Morum*, *Euglena hyalina*, *Euglena acus*, and *Menoidium incurvum* motility was lost in a carbonic acid-free medium. In some cases this was the result of the absence of free H-ions but in others it was apparently a specific effect of the absence of carbonic acid.—*R. M. Holman.*

2114. Metzner, P. **Die Bewegung und Reizbarkeit der bipolar gegeisselten Spirillen. [The movement and stimulus response of spirilla with bipolar flagella.]** Jahrb. Wiss. Bot. **59**: 325–412. 1919.—By observation of the active organisms in the dark field by rhythmic intermittent illumination the author has investigated the mechanics of the movement of *Spirillum volutans* and *Spirillum undula* under normal conditions and when subjected to chemical and thermal stimulation. These organisms have a single tuft of flagella at each end, consisting of as many as 25 separate flagella united into one rather coarse cord which functions like a single flagellum. This is spiral in form and when active describes rotation figures of various forms, the anterior one a bell opening backward and the posterior one a cup-shaped figure also opening towards the rear. The rotation of this composite flagellum results presumably from the contraction, one after another, of the component flagella. The organism is propelled through the water in a straight path as the result of the rotation imparted to the body of the *Spirillum* by the activity of the flagella. The rates of the rotation of the two flagella are about the same. In *S. volutans* it is about forty per second and the rotation rate of the body about thirteen per second. The most common reaction to any stimulus is a backward movement resulting from simultaneous reversal of the direction of rotation of the flagella. The center for the perception of stimulus is apparently at the base of the flagella. Transfer of stimulus from one end to the other of the organism is so rapid that normally reaction by both flagella is practically simultaneous. In case of very weak stimulation or lowered irritability a distinct interval may intervene between the reactions, or reaction may be restricted to the end directly stimulated. Moderate temperature increase merely accelerates flagella movement, but further warming checks it, presumably because of exhaustion of raw materials resulting from great increase of normal processes of metabolism. When photodynamically active pigments are present in the surrounding medium flagella activity is checked by light but it may be resumed if the photodynamic action is interrupted in time. Depression of temperature causes reversal of the movement of the flagella and continuous diffuse cooling results in rhythmically repeated reactions, as does also a weak homogeneous solution of cocaine or chloroform or any continuous stimulation.—*R. M. Holman.*

DIFFUSION, PERMEABILITY

2115. Guérin, P., et Ch. Lormand. **Action plasmolysante d'un certain nombre de vapeurs. [Plasmolytic action of certain gases.]** Compt. Rend. Acad. Sci. Paris **170**: 1598–1601. 1920.—Methyl alcohol is found to act more quickly than ethyl alcohol, and benzylic

alcohol acts more slowly. Phenols cause the liberation of hydrocyanic acid. Aldehydes also cause the liberation of hydrocyanic acid, but without plasmolysis in proportions of 10–20 drops to a liter. Trioxymethylene 0.2 gm. per liter, and 10 drops of 25 per cent formaldehyde, cause the liberation of HCN. Acroleine, 1 drop per liter, causes plasmolysis, and with 50 drops per liter it stops fermentation. Quinone, pyridine, HCl, and H_2SO_4 cause plasmolysis. —*C. H. Farr.*

2116. Lewis, Francis J., and Gwynethe M. Tuttle. **Osmotic properties of some plant cells at low temperature.** Ann. Bot. 34: 405–416. *Fig. 1–5.* 1920.—The authors carried out serial determinations of osmotic pressure, electrical conductivity, and amounts of sucrose, maltose, and glucose in leaf tissues of both woody and herbaceous evergreens. They hesitate to record any correlation between these values and the temperature records on the results of the work on one season only, but they note the occurrence of maximum osmotic concentration either in December or in March. They found that the osmotic pressure was due chiefly to nonelectrolytes, the concentration of electrolytes changing but little throughout the season. Sugars disappear progressively from winter to summer, glucose being the last to be removed. An important fact in relation to resistance to frost-injury is revealed by supercooling experiments. Whereas the sap extracted from leaves of *Pyrola* froze at about −3°C., the leaves themselves could be cooled to −32°C. before freezing. A significant observation is also recorded regarding the chloroplast, which was seen to become disorganized during the winter months, the chlorophyll distributing itself around the nucleus, coalescing to form plastids again in April.—*F. J. Lewis.*

2117. Shull, Charles A., and S. P. Shull. **Absorption of moisture by gelatin in a saturated atmosphere.** Amer. Jour. Bot. 7: 318–326. *1 fig.* 1920.—The authors summarize briefly the work of von Schröder on the absorption of water by gelatin from liquid water and from a saturated atmosphere. On repeating a part of his experiments they obtained very different results, finding that gelatin absorbed much more water from a saturated atmosphere than von Schröder reported. Instead of reaching an equilibrium at a gain of 40 per cent in about a week, this absorption continued steadily until the end of the experiment (47 days), when water equal to over 170 per cent of the gelatin had been absorbed.—Equations for the curves of moisture intake are given. The authors call attention to the difficulty of maintaining a saturated atmosphere, and suggest that the difference between their results and von Schröder's is due to their greater success in this respect.—*E. W. Sinnott.*

WATER RELATIONS

2118. Birch-Hirschfeld, Luise. **Untersuchungen über die Ausbreitungsgeschwindigkeit gelöster stoffe in der Pflanze. [Rate of transfer of dissolved substances in the plant.]** Jahrb. Wiss. Bot. 59: 171–262. 1919.—The author has investigated in various plants the rate of conduction of solutions of lithium nitrate, ammonium carbonate, alcohol, methylene blue, eosin, and other substances in the parenchyma of the cortex and in the phloem. The downward movement of certain of these solutions in the water-conducting channels, simultaneous with the upward movement of the transpiration stream, was also studied. The experiments were undertaken with the object of throwing new light upon the natural transfer of materials in the plant. Conduction in the phloem was found to be at approximately the same rate as in the parenchyma, and not in excess of the rate of transfer by simple diffusion. Transpiration proved to be without influence upon the rate of transfer, in the phloem, of the substances employed. Potometer measurements of the water conducted by stems from which a length of the central cylinder had been removed showed the tissues outside the cambium to be able to conduct only from $\frac{1}{10\,000}$ to $\frac{1}{10\,000}$ of the water required by a normally transpiring branch. Lithium nitrate in solution was found to pass, though very slowly, through the thickened and cutinized endodermis of *Convallaria majalis*. The cuticle of the leaves of a number of plants was found to be relatively highly permeable to lithium nitrate solution, as was shown by the detection of the salt in the leaf and stem at some distance from a point on the intact upper side of a leaf where a drop of the solution had been placed. When

such a solution was supplied through the cut end of a side branch of a leafy shoot, downward conduction of the salt in the main axis took place even below the leafy region of the latter. The same result was observed even when there was an abundant supply of water from below, and in the absence of any pull by transpiring leaves. It was shown that the water channels under normal conditions function independently of each other. This was particularly clear when an eosin solution entered by a side branch. In such cases the staining in the woody cylinder below the point of attachment of the branch was sharply limited to the side on which the branch was attached. The downward movement observed was at a much lower rate than that of the normal transpiration stream but reached 1 to 10 cm. an hour when a 1 per cent lithium nitrate solution was used. The time required to transport a unit quantity of the salt a given distance was from $\frac{1}{20}$ to $\frac{1}{200}$ of that required by living tissue. However, the author doubts whether the ability of the wood to conduct dissolved substances downward at certain times is sufficient to provide for the necessary downward transport of material in the living plant.—*R. M. Holman.*

2119. Pfeiffer, T., und A. Rippel. **Über den Einfluss von Durstperioden auf das Wachstum der Pflanzen. [Regarding the effects of periods of drouth upon the growth of plants.]** Landw. Versuchssta. **96**: 353–363. 1920.—Lupines, asparagus, barley, and oats were grown under 2 sets of conditions as regards moisture content of the soil. In one case the moisture content of the soil was maintained at 60 per cent of the water-holding capacity of the soil, and in the other the plants were regularly allowed to go without watering until the moisture content of the soil had fallen to about 30 per cent of its water-holding capacity, after which it was again brought up to 60 per cent. This alternate lowering and raising of the moisture supply was repeated up to harvest time. It was found that under the alternating periods of drouth, crop production was decreased as follows: Lupines 20.5 per cent, asparagus 15.5 per cent, barley 6.2 per cent, and oats 3 per cent as compared with the plants grown under a constant, full supply of soil moisture. It is evident that different kinds of plants vary in their ability to adapt themselves to varying moisture supply.—*A. T. Wiancko.*

MINERAL NUTRIENTS

2120. De Angelis d'Ossat, G. **Ancora sul calcare e le viti americane. [American grapes and lime.]** Staz. Sper. Agrarie Ital. **53**: 97–100. *Pl. 2.* 1920.—This is a short contribution upon the subject of adaptation of *Vitis Berlandieri, V. candida, V. rupestris, V. riparia, V. labrusca,* and *V. vinifera* to various concentrations of calcium carbonate in the soil. The conclusion is reached that the above mentioned species can develop normally and with no symptom of chlorosis in soils the concentration of which in $CaCO_3$ is much greater than is generally considered safe in practise. The calcimetric scale of Bonnet is found to be of very little value.—*A. Bonazzi.*

2121. Geilman. **Über die Verbreitung des Titans in Böden und Pflanzen. [The distribution of titanium in soils and plants.]** Jour. Landw. **68**: 107–124. 1920.—A method of determining the titanium content of soils is given, and its value tested. Analyses of a number of soil samples showed that titanium is very widely distributed in soils, the content varying from a trace to 1 per cent, with most of them showing from 0.3 to 0.6 per cent. Analyses of plants showed titanium always present, the content being greatest in the green parts, and the range being from a trace to 0.27 per cent.—*C. E. Leighty.*

2122. Gile, P. L., and J. O. Carrero. **Cause of lime-induced chlorosis and availability of iron in the soil.** Jour. Agric. Res. **20**: 33–61. *Pl. 5–6.* 1920.—A brief review of ecological studies of calciphilous and calcifugous plants, and of vegetative experiments in which chlorosis has been produced by natural or artificial calcareous soils.—Experimental data are presented from which it is concluded that " 'lime-induced' chlorosis seems to be due simply to a depression in the availability of iron in calcareous soils." Treatment of chlorotic rice with a spray of ferrous sulphate shows that a lack of iron in the plant is at least one cause of the chlorotic appearance. There is no evidence of a general "lime effect" inducing chlorosis.—

Several pure, organic compounds of iron were used in pot experiments with soil but proved to be poor sources of iron for small rice plants. Bulky organic compounds such as stable manure, velvet bean plants, and tobacco stems when used in considerable quantity gave increased yields over non-fertilized pots, and it is thought that more iron becomes available from such sources.—The availability of iron is slightly greater when the soil moisture is at optimum content for growth than when the soil is too wet, but certain calcareous soils which commonly induce chlorosis in rice fail to do so when the soil is flooded.—*D. Reddick.*

2123. Johnston, Earl S. **Nutrient requirements of the potato plant grown in sand cultures treated with "type I" solutions.** Soil Sci. **10**: 389–409. *1 pl., 5 fig.* 1920.—Potato sprouts separated from the seed pieces were grown in sand cultures treated with 21 different proportions of monobasic potassium phosphate, calcium nitrate, and magnesium sulphate. The partial osmotic pressure varied by equal increments of $\frac{1}{8}$ the total osmotic pressure of 1 atm. Cultures giving the highest yields were low in magnesium sulphate, high in calcium nitrate, and medium in potassium phosphate. The lowest were low in calcium nitrate. The average water requirement was 403. No relation between high yield and low water requirement nor low yield and high water requirement was noted.—*W. J. Robbins.*

2124. Pfeiffer, T., und A. Rippel. **Der Einfluss von Kalk und Magnesia auf das Wachstum der Pflanzen. [The influence of lime and magnesia on the growth of plants.]** Jour. Landw. **68**: 5–39. 1920.—Experiments were made on oats in pots with clean, washed glass-sand as substratum. Similar yields were produced when the molecular relationship of CaO:MgO fluctuated between the limits 9:1 and 1:1 in 4 different series where increasing doses of CaO and MgO were employed. The amounts of CaO and MgO taken up by the plants as found by analyses led to the same conclusions as those from plant yields. The yield decreased when CaO:MgO relationship increased from 1:1 to 1:9, interpreted as due to lack of lime necessary to plant growth and not direct injury from MgO. Where the limit lies at which the undoubtedly existing antagonistic action between MgO and CaO begins to have a tangible, practical significance was not established. Some indications (not confirmed) of the possibility of substituting for CaO and MgO were noted. The CaO and MgO content of oat plants varies within wide limits and is in part unusually high. The general rule that in the seed MgO should be more important, and in the straw CaO, agrees with these experiments only infrequently, and by no means universally. In opposition to other observations, an increasing MgO content has not resulted in increased P_2O_5 accumulation. A certain relationship between CaO:MgO:P_2O_5 in the sense used by Loew was not confirmed. The content of the oat plant in K_2O and especially in Na_2O, so far as determined, has a stationary value and does not decrease under the influence of added amounts of CaO and MgO. The lime-potassium law is not confirmed by the foregoing experiments.—*C. E. Leighty.*

2125. Pfeiffer, T., und W. Simmermacher. **Die Kalkfeindlichkeit der Lupine. [The aversion of the lupine to lime.]** Landw. Versuchssta. **93**: 1–47. 1919.—According to earlier investigations, discussed in articles published in Mitt. Landw. Inst. Bresslau **6**: 1911, and **7**: 1914, it seemed that while the ill effects of lime upon the lupine were evidently due to the plant's general sensitiveness to alkaline substances, there were indications that lime in itself might be harmful regardless of its combination. It was concluded, however, that other factors might enter into the injury to lupines, such as reduction of phosphorus assimilation, variations in assimilation of iron, and effect upon nodule-forming bacteria. To test these points as well as to further study the effects of different lime compounds, the authors conducted pot experiments. The results indicate that lime as calcium carbonate is beneficial rather than harmful. The evidence regarding the effect upon nodule formation and phosphorus and iron assimilation is inconclusive. It is concluded that further investigations along this line will be necessary.—*A. T. Wiancko.*

2126. Rippel, August. **Beitrag zur Kenntnis des Verhaltens der Aschebestandteile und des Stickstoffs im herbstlich vergilbenden Laubblatt. [Contribution to a knowledge of the behavior of the ash substances and nitrogen in autumn leaves.]** Jahresber. Ver. Angew. Bot.

16: 122–132. 1918.—On the basis of his experiments Rippel does not believe in the theory of the conservation to the plant of the potassium, phosphorus, and nitrogen compounds, held by some investigators as the explanation of the recession of these compounds during the yellowing of the leaves in the fall. He thinks the reason for the early recession (even before yellowing) of potassium from the leaf to the plant is to fulfill some at present unknown function and that the later recession of phosphorus and nitrogen is due to the fact that during yellowing of the leaf the transfer of substances from the leaf to the plant far outbalances the flow into the leaf of such substances.—*Orton L. Clark.*

PHOTOSYNTHESIS

2127. Anonymous. **Gas as a fertilizer.** Sci. Amer. Monthly 1: 562. 1920.—This is a brief description of German experiments on the effect of increased amounts of carbon dioxide on the growth and development of plants.—*Chas. H. Otis.*

2128. McLean, F. T. **Field studies of the carbon dioxide absorption of coco-nut leaves.** Ann. Bot. 34: 367–389. 1920.—There is described a method of measuring the carbon dioxide absorption of field crops in situ under conditions as little modified as possible. The method is found to be satisfactory in studying the comparative rates of absorption of leaves from the same plant or different kinds of plants, and also the same leaves at different times of the day. Data obtained by this method show that the middle-aged leaves of coconut absorb carbon dioxide more rapidly than young or mature leaves. The maximum rate of absorption is in the morning, followed by a depression at mid-day, a second rise in the afternoon, and a final decline towards sunset. Detached pinnae of a coconut leaf exhibit the maximum absorption at a different time of day from that of the attached ones, but the rates of absorption are similar in both cases. *Abaca* leaves are found to have an absorption rate similar to coconut while those of sugar cane absorb carbon dioxide much more rapidly.—*Joanne L. Karrer.*

2129. Ravenna, C. **Sulla formazione dell'amido nelle piante verdi. [The formation of starch in green plants.]** Atti R. Accad. Lincei Roma Rend. (Cl. Sci. Fis. Mat. e Nat.) **V, 29**[1]: 148–150. 1920.—The author replies to an article by Polacci (Atti Istit. Bot. Univ. Pavia **II, 27**: 29. 1917) criticising the author's previous article (Rendiconti **V, 25**[1]: 649. 1916).—*F. M. Blodgett.*

2130. Wright, R. C. **An apparatus for determining small amounts of carbon dioxide.** Amer. Jour. Bot. 7: 368–370. *1 fig.* 1920.—The author has developed a light, compact, and sensitive apparatus for measuring the amount of carbon dioxide in the air, for special use in storage plants. Its structure and manipulation are described.—*E. W. Sinnott.*

2131. Wurmser, René. **Action sur la chlorophylle des radiations de différentes longuers d'onde. [The effect on chlorophyll of rays of different wave lengths.]** Compt. Rend. Acad. Sci. Paris 170: 1610–1612. 1920.—Photochemical susceptibility is found to be related to wave length in approximately the proportion of the absorption constants, except in the case of minimum absorption where it decreases very rapidly. The radiation of the two principal bands of red and violet are equally active for equal energy values.—*C. H. Farr.*

METABOLISM (GENERAL)

2132. Bourquelot, et Bridel. **Obtention biochimique du sucre de cane à partir du gentianose. [Sucrose from gentianose by biochemical methods.]** Compt. Rend. Acad. Sci. Paris 171: 11–15. 1920.

2133. Ciamician, G., e C. Ravenna. **Sul contegno di alcune sostanze organiche nei vegetali. Nota XII. [Upon the behavior of some organic substances in plants.]** Gazz. Chim. Ital. 50: 13–46. *Fig. 1–17.* 1920.—This is a continuation of the work published by the authors upon the action of organic substances on the growth of young seedlings of *Phaseolus.* In the present contribution the plants studied were: *Phaseolus, Cucurbita, Vicia,* and *Lyco-*

persicum. The compounds studied were methylamine, ethylamine, propylamine, butylamine, amylamine, isoamylamine, formamide, acetamide, butyric acid, isobutyric, oxalic, and succinic acids; potassium, methyl, and ethyl tartrates; sa ts of trimethylammonium; betaine, pyridine, picoline, quinoline, isoquinoline, quinaldine, cocaine, ecgonine, nor-ecgonine; and the methylic ether of nor-ecgonine. Caffeine, theobromine, nicotine, codeine, and morphine were also studied. A large variation in behavior towards the growing plants was observed, some being extremely toxic, others only producing etiolation and others being without action. Some of the compounds used have a stimulating effect upon the formation of chlorophyll with a resultant deeper shade of green in the leaves, and a greater production of starch. Trimethylamine, pyridine, piperidine, caffeine, theobromine, and pyrocatechine were found in the pulp of the bean plants after they had grown in solutions containing these substances.—The second part of the paper is given to the study of the transformation of the compounds in the pulp of *Spinacia*. Asparagine was found to be transformed into acetic aldehyde, acetic and succinic acids; lactic acid was synthesized into a compound which yielded it again on treatment with emulsin; salicylic acid behaved similarly to lactic acid, but it also gave rise to a small quantity of volatile acids.—*A. Bonazzi.*

2134. Ciamician, G., e C. Ravenna. **Sull-influenza di alcune sostanze organiche sullo sviluppo delle piante. Nota IV.** [**On the influence of some organic substances on the development of plants.**] Atti R. Accad. Lincei Roma Rend. (Cl. Sci. Fis. Mat. e Nat.) **V, 29¹**: 7–13. 1920.—This is a continuation of experiments previously reported (Rendiconti **V, 26¹**: 4; **27¹**: 38; **29¹**: 13) in which kidney-bean plants in cotton in germinators were watered with solutions one to a thousand of substances being tested. Tested in this way methylamine, ethylamine, propylamine, butylamine, and amylamine showed a diminishing toxicity (except in the case of the substance first mentioned), which paralleled the increasing length of the chain of carbon atoms. Isoamylamine was more harmful than normal amylamine and produced an albinism similar to that produced by nicotine. Similarly the isobutyrate of potassium was more harmful than the normal butyrate. Foramide was deleterious while acetamide was not. Oxalic acid caused a poorer growth than succinic acid. Methyl and ethyl tartrate produced spots on the primordial foliage while potassium tartrate was harmless. Quinoline, isoquinoline, and quinaldine were all poisonous, the last most so. While cocaine proved strongly toxic, ecgonine and the methyl ether of nor-ecgonine only caused a few spots on the first leaves and nor-ecgonine was without effect. A few experiments were made with other plants which were in general only affected by the more toxic substances and showed considerable differences in behavior. That theobromine and caffeine stimulate a production of starch was confirmed. Spectroscopic examination of alcoholic extracts of certain experimental plants, dark in color, showed only quantitative differences.—*F. M. Blodgett.*

2135. Ghirlanda, Carlo. **Sulle sostanze tanniche del "Morus alba."** [**Tannic substances in Morus alba.**] Atti. R. Accad. Lincei Roma Rend. (Cl. Sci. Fis. Mat. e Nat.) **V, 29¹**: 146–148. 1920.—Analyses were made after the methods of Löwenthal and Schröder of various parts of the mulberry tree. Except in the wood of the branches, considerable quantities of tannins were found in the different parts, the amount increasing in the following order: wood of the roots, cortex of the branches; cortex of the roots; foliage. The foliage contained more tannic substances in the morning than in the evening.—*F. M. Blodgett.*

2136. Hefs, K., und W. Weltzien. **Über die Fähigkeit der Pflanze optische Antipoden aufzubauen.** [**The possibility of plants building up optical antipodes.**] Ber. Deutsch. Chem. Ges. **53**: 119–129. 1920.—Experiments attempting to cause racemization of *d.* coniine and *d.* methyl coniine gave negative results.—*Henry Schmitz.*

2137. Jones, Walter. **The chemical constitution of adenine nucleotide and of yeast nucleic acid.** Amer. Jour. Physiol. **52**: 193–202. 1920.

2138. Kappen, H., und M. Zapfe. **Die Azidität der Pflanzensäfte unter dem Einfluss einer Kalkdüngung.** [**The acidity of plant juices under the influence of liming.**] Landw.

Versuchssta. 93: 135–146. 1919.—Beans and lupines were grown on a loamy sand soil without lime and with 1, 5, and 10 per cent additions of ground limestone. Harmful effects in proportion to the amount of liming were shown during the earlier stages of growth by yellowing of the leaves and even dying of the lower leaves in the worst cases, but these apparently harmful effects disappeared as the plants grew older. The hydrogen-ion concentrations of the juices of the roots and tops were determined at the time of blossoming and were found to be the same regardless of the amount of liming. The conclusion is that though plants grown on limed soil probably take up more lime, they are able to maintain the same acidity relations in their juices as on unlimed soil. It is pointed out that these determinations were made only at the time of blossoming and that there might be differences in the acidity of the plant juices at other stages of development.—*A. T. Wiancko.*

2139. Luigi, Bernardini. **La nicotina nel tabacco (contributo allo studio della genesi e della funzione degli alcaloidi.)** [**Nicotine in tobacco (contribution to the study of the genesis and function of the alkaloids).**] Atti R. Accad. Lincei Roma Rend. (Cl. Sci. Fis. Mat. e Nat.) **V, 29**[1]: 62–66. 1920.—The amount of nicotine in different parts of tobacco plants at different ages was determined. Analysis of very young plants with minute first leaves showed nicotine when grown in light but not when grown in darkness. Plants severely pruned did not utilize the nicotine as reserve nitrogen, and germinating tobacco seeds were retarded in germination by very dilute solutions.—*F. M. Blodgett.*

2140. Ponselle, A. **Détermination de la réaction des milieux de culture par la mesure de la concentration en ions hydrogène.** [**Determination of the hydrogen-ion concentration of culture media.**] Bull. Inst. Pasteur **18**: 601–610. 1920.—This is a short review of the theory of acidity and of the principles underlying the methods for the determination of hydrogen-ion concentrations. A few examples of simple calculations to be used in determining P_H values and a short exposition of the technique of the colorimetric methods are given. The work of Sörensen, Horwitz, Meyer and Ostenberg, Clark and Lubs, Homer, Ponselle, Barnett and Chapman, and of Fennel and Fisher is reviewed. The reader is cautioned against the use of the colorimetric method in adjusting the reaction of deeply colored media, and reference is made in this connection to the electrometric methods. The contribution is in fact a guide to be used in daily bacteriological operations and not a theoretical discussion of the subject.—*A. Bonazzi.*

2141. Ravenna, C., e G. Bosinelli. **Sul dipeptide dell'acido aspartico e sulla funzione dell'asparagina nelle piante.** [**Upon the aspartic acid dipeptide and the function of asparagine in the plant.**] Gazz. Chim. Ital. **50**: 281–288. 1920.—This is a continuation of the investigations published in 1919. The authors find that after long boiling, solutions of asparagine gave the biuret reaction, and were precipitated by lead acetate. The precipitate filtered and deleaded with H_2S gave a white amorphous powder of the following elementary composition: C, 38.78; H, 4.85; N, 11.60. Aspartic acid on the other hand yielded only ammonium aspartate. The authors conclude that the acid amides and not the simple amino acids are directly concerned in the building of polypeptides and the subsequent protein synthesis in plants. As Piutti claims asparagine to be a β-asparagine the polypeptide obtained must be formed by the linking of the amidic group on one side with the carboxylic on the other and should be isomeric with the β-polypeptide obtained by Fischer and Koenigs from 2–5 diketopiperazin-3–6 diacetic acid.—*A. Bonazzi.*

METABOLISM (NITROGEN RELATIONS)

2142. Cauda, A. **Metodo pratico per svelare negli schizomiceti l'attitudine a fissare l'azoto libero. (Nota preliminare.)** [**A practical method for the detection of nitrogen fixing properties in bacteria. A preliminary note.**] Staz. Sper. Agrarie Ital. **53**: 79–80. 1920.—The growth of unicellular algae, such as *Chlorella vulgaris*, *Protococcus*, and *Chlorococcus*, upon calcium carbonate-malto-gelatine is distinctly variable and directly correlated with nitrogen content of the medium. On agar to which no nitrogen has been added these algae develop

no chlorophyll even when exposed to light, and will continue to grow thus on successive transfers. When nitrogen is added to these chlorophylless growths the pigment is developed and the algae become normal although kept in darkness. This property has been used by the author in the attempt to determine whether bacteria introduced into the cultures of "white" algae are capable of fixing free nitrogen. Positive results were obtained with mixed cultures of a colorless alga and *Azotobacter chroococcum*. In the dark, when on acid maltogelatine, the alga in pure culture forms pigment, while on a neutral medium in the dark no pigment formation takes place, although transfer to the light is followed by chlorophyll formation. The addition of *Azotobacter* to "dark" cultures is also claimed to be followed by chlorophyll formation.—*A. Bonazzi.*

2143. Hepburn, Joseph Samuel, E. Quintard St. John, and Frank Morton Jones. **The absorption of nutrients and allied phenomena in the pitchers of the Sarraceniaceae.** Jour. Franklin Inst. **189**: 147–184. *7 fig.* 1920.—The general structure of the leaves of the various species of the Sarraceniaceae, which are all found on the American continent, are described. The nectar glands of the pitchers seem to exude *d*-fructose. The "wetting or narcotic principle" in the pitcher liquor of some of the species does not seem to be a saponine. Active proteolytic enzymes are present in all species of *Sarracenia* except *S. psittacina*, which was not studied in this respect. *Darlingtonia*, a monotypic genus, seems not to have such an enzyme. Closed pitchers are free from bacteria, but open ones soon contain proteolytic bacteria. Milk, meat broth, and some other substances cause the secretion of additional pitcher liquor. This liquid tends to return to its normal reaction to litmus in a few days after acids or alkalies are introduced. Water is absorbed by the plant from the pitchers at a slower rate than nitrogenous solutes and more rapidly than neutral phosphate in solution. The pitcher liquor increases when a phosphate buffer with a nitrogenous substance in solution is introduced, and the nitrogen is absorbed. "The per cent of the introduced nitrogenous compound or phosphate absorbed usually increased with the period of absorption." The lithium ion was detected in the tissues of *Sarracenia purpurea* after neutral lithium citrate had been introduced into the pitchers. Decrease in nitrogen and phosphorus was the criterion used to determine the absorption of these elements from the pitcher liquor.—*Ernest Shaw Reynolds.*

2144. Strowd, W. H. **The determination of nitrites and nitrates in plant tissue.** Soil Sci. **10**: 333–342. 1920.—The Caron method and the nitron method of Busch as well as the Kjeldahl-Gunning-Arnold method and the Kjeldahl method modified to include nitrates are unsatisfactory for determining nitrates in plant tissue. The Devarda and Schloessing methods with modifications can be used. The modifications are described.—*W. J. Robbins.*

2145. Strowd, W. H. **The relation of nitrates to nodule production.** Soil Sci. **10**: 343–356. 1920.—The concentration of nitrates in the cell sap of the roots of soy bean is many times the concentration of nitrates in the soil. The concentration increases with arrested photosynthesis and with increase in nitrate concentration in the soil, but not proportionately. Nitrates have little effect upon the hydrogen-ion concentration of the plant juice. The amount of reducing sugar in plants decreases with increase in nitrate. The concentration of nitrate present in the plant sap when nodule production is inhibited is sufficient to prevent the growth of *Rhizobium leguminosarum* in the soil.—*W. J. Robbins.*

METABOLISM (ENZYMES, FERMENTATION)

2146. Fernbach, A., et M. Schoen. **Le rôle de l'aldehyde dans la fermentation alcoolique. [The role of acetic aldehyde in alcoholic fermentation.]** Bull. Inst. Pasteur **18**: 385–406. 1920.—A review and a synthetic study of our knowledge on the subject. The work of Neubauer and Fromhertz on the breakdown of the amino acids in the animal body by the path of alanin-α-amino propionic acid-pyruvic acid-acetaldehyde-ethylic alcohol is taken as a starting point for the review. The work of Neuberg and Karczag, Neuberg and associates, Fernbach and Schoen, Mazé, Lintner and Liebig, J. B. Dumas, Connstein, and Leudeke

has shown that the above reactions can be brought about by yeast juice and are due to a special enzyme which has been named carboxylase, since it has the power of forming CO_2 from the carboxylic group. This same enzyme has been found active in various organisms, among which are various forms of *Oidium* and several bacterial species. The work of Neuberg and Reinfurth showed the rôle of sulphites in the production of acetaldehyde by the yeast cell, and the work of Neuberg and Kreb led to the assumption that methylglyoxal was formed as one of the steps in the action, a substance which could easily yield glycerin. Thus the classical formula of fermentation would take the form of $C_6H_{12}O_6 = CH_3COH + CO_2 + C_3H_5(OH)_3$, and in presence of sulphites the action would be symbolized by $C_6H_{12}O_6 + Na_2SO_3 + H_2O = C_3H_5(OH)_3 + CH_3CH(OH)O.SO_2Na + NaHCO_3$. In 1919 Neuberg and Hirsch have shown that the living yeast if allowed to act in an alkaline medium in absence of sulphites forms acetic acid in large quantities. A direct oxidation of the aldehyde can not be assumed, since the action is taking place in an atmosphere of CO_2; furthermore, the ratio of acetic acid to glycerin is 1:3. Applying the Cannizzaro reaction to the oxidation of acetaldehyde and uniting it with the reaction of Neuberg and Reinfurth we have: $2CH_3COH + H_2O = CH_3CH_2OH + CH_3COOH$ and $2C_6H_{12}O_6 = 2C_3H_5(OH)_3 + 2CO_2 + 2CH_3COH$. A list of the articles cited in the review is appended.—*A. Bonazzi.*

2147. Fred, E. B., and W. H. Peterson. **The fermentation of xylose by bacteria of the aerogenes, paratyphoid B., and typhoid groups.** Jour. Infect. Diseases 27: 539–549. 1920.—The medium used consisted of fresh yeast extract, containing 0.5 per cent dibasic potassium phosphate, 0.5 per cent peptone and 2 per cent xylose. After the organisms were grown for 24 hours in the Smith fermentation tube, 2 cc. of sterilized mercury were added to check the diffusion and escape of carbon dioxide. Xylose was found to be attacked by the organisms of the aerogenes-typhoid group with the production of volatile, nonvolatile, and gaseous substances, the by-products of the organisms included in this group differing quantitatively and qualitatively. The products of fermentation with *B. lactis aerogenes* are essentially carbon dioxide, hydrogen, and alcohol, and small amounts of a volatile acid. The products of fermentation of *B. paratyphoid* B. are formic, acetic, butyric, lactic, and succinic acids, ethyl alcohol, carbon dioxide, and hydrogen. The typhoid group does not attack xylose so readily as the other organisms; the chief substances formed are formic, acetic, butyric, and succinic acids, alcohol, and a trace of carbon dioxide.—*Selman A. Waksman.*

2148. Klöcker, Alb. **Recherches sur les organisms de fermentation. IV Contribution à la connaissance de la faculté assimilatrice de douze espèces de levure vis-à-vis de quatre sucres. [Researches on organisms of fermentation. Contribution to the knowledge of the assimilation of four sugars by twelve species of yeasts.]** Compt. Rend. Trav. Lab. Carlsberg 14^7: 1–40. 1919.—Seven species of *Saccharomyces, S. cerevisiae, S. Carlsbergensis, S. ellipsoideus, S. Pastorianus, S. turbidans, S. Marxianus, S. fragilis, Zygosaccharomyces Priorianus, Saccharomycodes Ludwigii, Debaryomyces globosus, Schwanniomyces occidentalis,* and *Schizosaccharomyces octosporus* were tested for ability to assimilate dextrose, maltose, lactose, and saccharose, using 3 different sources of nitrogen, viz., "yeast water," asparagin, and peptone. The index of assimilation was cell multiplication; the number of cells in a culture was determined at the time of sowing and after various periods of incubation by means of a haematimeter. The sugars were added singly to yeast water or to a synthetic nutrient solution consisting of $MgSO_4$, KH_2PO_4, and either asparagin or peptone. Chemicals of highest purity were used but the difficulty of avoiding introduction of minute traces of nitrogen in the water, sugars, or salts used in the medium is pointed out. No statement as to the utilization of a sugar by a given species is complete without specifying the source of nitrogen, since both assimilation and cell multiplication vary with this. Yeast water was the most favorable source of nitrogen, but peptone served as well in many cases, while asparagin was either a favorable source or not utilized, depending on the species. A yeast may sometimes assimilate a sugar which it is incapable of fermenting. No yeast organism has yet been found capable of assimilating free atmospheric nitrogen. Dextrose and saccharose, in the presence of yeast water, are utilized by all species studied; maltose is used by all but one, *Saccharomyces fragilis,* which is unique in its ability to assimilate lactose.—*F. Weiss.*

2149. Knudson, Lewis. **The secretion of invertase by plant roots.** Amer. Jour. Bot. 7: 371–379. *1 fig.* 1920.—Reducing sugars frequently appear in culture solutions containing sucrose. In a series of culture experiments with corn and Canada field peas the production of these sugars was studied. Evidence is given that their appearance is not due to the reaction of the culture solution; or to the secretion of invertase by the roots (since the amount of reducing sugar is not increased by incubation). The author believes that these sugars are produced in the root and excreted into the culture solution.—*E. W. Sinnott.*

2150. Piedallu, Andrè, Philippe Malvezin, et Lucien Grandchamp. **Sur le traitement de la casse bleue des vins.** [**The treatment of blue cassia of wines.**] Compt. Rend. Acad. Sci. Paris **170**: 1129–1131. 1920.

2151. Ravenna, C. **Sintesi di un peptide dall'acido aspartico cogli enzimi vegetali.** [**Synthesis of a peptide of aspartic acid by vegetable enzymes.**] Atti R. Accad. Lincei Roma Rend. (Cl. Sci. Fis. Mat. e Nat.) **V, 29**[1]: 55–58. 1920.—A mixture of ground spinach foliage, asparagine, and water, with toluol as an antiseptic, was kept in an incubator 20 days. From the liquid a yellowish precipitate was thrown down with basic acetate of lead. This was purified and a considerable quantity of oxalic acid separated from it leaving a substance having some properties characteristic of the dipeptid of aspartic acid. Control solutions were compared with this. It is held that asparagine may prove to be one of the first steps in the formation of proteins in plants.—*F. M. Blodgett.*

2152. Ravenna, C. **Sintesi di un peptide dell'acido aspartico cogli enzimi vegetali.** [**The synthesis of an aspartic acid peptide by means of enzymes from vegetable cells.**] Gazz. Chim. Ital. **50**: 251–255. 1920.—See preceding entry 2151.

2153. Schoellhorn, Kurt. **Sur la fermentation de quelques levures des nectars des plantes d'hiver.** [**Fermentation produced by certain yeasts obtained from the nectar of winter plants.**] Bull. Soc. Bot. Genève **11**: 154–190. *29 fig.* 1919.—A physiological study is presented for 12 strains of *Torula* which were isolated from the nectar of various flowering plants. One of the organisms is described as a new species and assigned to a new genus, *Nectaromyces cruciatus* Schöll.—*W. H. Emig.*

ORGANISM AS A WHOLE

2154. Hall, Ivan C. **Practical methods in the purification of obligate anaerobes.** Jour. Infect. Diseases **27**: 576–590. 1920.—Attention is called to the failure of some early investigators to secure unquestionably pure cultures of obligate anaerobes. A critical review of the present status of surface culture, deep culture, and microscopic methods is given. Selective enrichment of the medium and the elimination of aerobic contamination through selective heating and selective cultivation, followed by the method of isolation by deep cultivation in glucose agar, is found most practical for the purification of obligate anaerobes.—*Selman A. Waksman.*

2155. Pantanelli, E. **Influenza della nutrizione e dell'attivita radicale sul colasso e il disseccamento prodotti dal freddo.** [**Influence of nutrition and root activity on the injury produced by cold.**] Atti R. Accad. Lincei Roma Rend. (Cl. Sci. Fis. Mat. e Nat.) **V, 29**[1]: 66–71. 1920.—Chick pea and bean plants growing in pots in fine earth or quartz sand to which had been added various nutrient salts were exposed to low temperatures and compared with check plants. The author concludes that the sufferance of each cell is directly proportional to the outgo of water during cooling. The richness in sugars and other carbohydrates, an abundant supply of phosphates, and a scarcity of autodigestive enzymes enable the plasma to hold more tenaciously to water. Acidity and an abundant phosphate supply in the soil favor recovery while alkalinity and abundance of nitrogen render plants more delicate. Tests were also made to determine the effect of different amounts of soil moisture and the effect of subjecting different parts of the plant to chilling temperatures. It is concluded

that the condition of the roots is of the greatest importance in determining whether a plant recovers or not, i.e., whether the roots are in condition to supply the water to replace that removed from the tisssues by the low temperatures.—*F. M. Blodgett.*

2156. Peters, R. A. **Nutrition of the protozoa. The growth of Paramoecium in sterile culture medium.** Jour. Physiol. [London] 53[6]: cviii–cix. 1920.—A medium for the successful cultivation of a pure culture of *Paramoecium* contained the following: NaCl, KCl, $CaCl_2$, Na_2HPO_4, KH_2PO_4, $MgSO_4$, $NaHCO_3$, phenol red, glucose, histidine, arginine, leucine, ammonium lactate, and traces of $FeCl_3$, KI, and $MnSO_4$. When single amino acids are supplied, histidine, arginine, or leucine gives a much more rapid growth than tryptophane. Galactose and fructose, but not maltose, may be substituted for glucose.—*Ernest Shaw Reynolds.*

GROWTH, DEVELOPMENT, REPRODUCTION

2157. Friesner, Ray C. **Daily rhythms of elongation and cell division in certain roots.** Amer. Jour. Bot. 7: 380–407. *2 pl.* 1920.—Previous work on rhythm of elongation and cell division in plants is summarized. Hourly observations were made on the elongation of root tips of several species which were grown in a dark room and kept under constant temperature. Material from roots growing under these conditions was killed every 2 or 3 hours and studied microscopically to determine rate of cell division. Elongation in all cases was found to proceed in a rhythmical manner, 2 or more waves occurring during a 24-hour period. The time of occurrence of maxima and minima is dependent upon the time of initiation of metabolic activity rather than upon time of day by the clock. Cell division proceeded in a similar rhythmic fashion. The maxima and minima for elongation as compared to cell division were generally found to alternate with one another, only rarely occurring simultaneously. The author suggests that this alternation is perhaps due to the lack of sufficient energy to permit both processes to go on at the same time at their maximum rates. He believes that this reciprocal relation between elongation and cell division accounts for most of the rhythms found in these plants.—*E. W. Sinnott.*

2158. Murrill, Wm. A. **The dendrograph—an instrument that keeps tabs on tree growth.** Sci. Amer. 122: 595. *3 fig.* 1920.

2159. Pfeiffer, T., und W. Simmermacher. **Über den Einfluss der Steine im Boden auf das Wachstum der Pflanzen. [The influence of stones in the soil upon the growth of plants.]** Landw. Versuchssta. 93: 49–63, 277–284. 1919.—Two series of experiments to determine the effect of stones in the soil upon the growth of plants are reported. In the first series oats was used as the test crop, and in the second carrots. The experiments were conducted in earthenware pots, equal weights (3.4 kgm.) of a loam soil being used in all cases. Gravel stones from 1 to 3 cm. in diameter were mixed with the soil in 3 series of pots in 3 different proportions, namely 25, 50, and 75 per cent. The cultures were compared with a control series containing only the 3.4 kgm. of soil. All pots were regularly watered to saturation with uniform nutrient solutions.—The results show practically the same top and root development in all cases with both oats and carrots, and lead to the conclusion that with equal amounts of water and nutrients, the presence of stones in the soil had no influence upon plant production.—*A. T. Wiancko.*

2160. Reed, H. S. **Slow and rapid growth.** Amer. Jour. Bot. 7: 327–332. *2 fig.* 1920.—The growth in length of shoots from pruned and unpruned apricot trees was measured weekly during the growing season. A close correspondence was found between the growth rates in these two cases and the differential equation for growth rate previously proposed by the author [$x = a(1-e^{-kt})$, where x is the size of the organism at time t, a the final size attained, and k a constant.] The rate of growth of these shoots, which is much higher in pruned than in unpruned trees, thus seems to depend upon the final length which they attain. The author suggests that growth is some sort of a catalytic process, the organism being the end product of a process in which a catalyst acts upon a substrate.—*E. W. Sinnott.*

2161. Schouteden-Wéry, J. **Quelques expériences de régénération de bourgeons chez les racines de chicorées.** [**Regeneration of buds on the roots of chickory.**] Acad. Roy. Belgique, Bull. Cl. Sci. **1920**: 152–166. *13 fig.* 1920.—These experiments were made with the roots of the vegetable known as Brussels chickory, and they have demonstrated a material of the highest order for the investigation of polarity.—The nature of the work is revealed by the following conclusions: (1) Roots of the chickory manifest a bud polarity which is strongly marked; in any position the proximal region produces the buds. (2) This bud polarity may not suffer inversion but nevertheless is affected by the external factors gravity and light which intervene in the production of buds at the opposite pole. These external factors supplement the internal factors and produce the same effects.—*Henri Micheels.*

2162. Waller, A. D. **On the so-called growth of amputated parts of plants.** Jour. Physiol. [London] **54**[1,2]: xix–xx. 1920.—An adverse criticism of demonstrations made by Sir J. C. Bose of his "crescograph" by which growth of amputated tips of hyacinth leaves was claimed. The author regards these crescograph records as inconclusive, both because of possible instrumental and physical errors and because of mere turgor changes. "Growth is an irreversible change and is attended by continuous gain of length," while "turgor is a reversible change; gain or loss of water causes gain or loss of length."—*Ernest Shaw Reynolds.*

MOVEMENTS OF GROWTH AND TURGOR CHANGES

2163. B., V. H. **Movements of plants.** [Rev. of: Bose, J. C. **Life movements in plants.** Trans. Bose Res. Inst. Calcutta **2**: 253–597 + i–xv. 1919.] Nature **105**: 416–417. 1920.—Reviewer finds the work not well related to that of previous investigators.—*O. A. Stevens.*

2164. Bose, J. C. **Life movements in plants.** Trans. Bose Res. Inst. Calcutta **1**: 1–252 + i–xxiv. *Fig. 1–92.* 1918; **2**: 253–597 + i–xv. *Fig. 93–220.* 1919.—The 2 volumes (continuously paged) constituting the Transactions of the Institute for 1918 and 1919 present the results of experimental work on the "life movements in plants" under the following major subdivisions: (1) response of plant organs, (2) growth and its responsive variations, (3) tropisms, and (4) night and day movements. The special topics investigated and the names of those assisting, where such assistance was rendered, are given below: i.—The problem of movements in plants. ii.—The "praying" palm tree (assisted by N. N. Neogi). iii.—Action of stimulus on vegetable tissues (assisted by N. N. S. Gupta). iv.—The diurnal variation of moto-excitability in *Mimosa.* v.—Response of petiole-pulvinus preparation of *Mimosa pudica* (assisted by S. C. Das). vi.—On conduction of excitation in plants. vii.—On electric control of excitatory impulse. viii.—Effect of indirect stimulus on pulvinated organs (assisted by G. Das). ix.—Modifying influence of tonic condition on response (assisted by G. Das). x.—The high magnification crescograph for researches on growth (assisted by G. Das). xi.—Effect of temperature on growth (assisted by S. C. Dass). xii.—The effect of chemical agents on growth (assisted by G. Das). xiii.—Effect of variation of turgor and of tension on growth. xiv.—Effect of electric stimulus on growth (assisted by G. Das). xv.—Effect of mechanical stimulus on growth. xvi.—Action of light on growth (assisted by G. Das). xvii.—Effect of indirect stimulus on growth (assisted by G. Das). xviii.—Response of growing organs in state of sub-tonicity. xix.—Resumption of autonomous pulsation and of growth under stimulus. xx. Action of light and warmth on autonomous activity. xxi.—A comparison of responses in growing and non-growing organs (assisted by G. Das). xxii.—The balanced crescograph. xxiii.—On tropic movements. xxiv.—Tropic curvature with longitudinal transmission of effect of stimulus (assisted by G. Das). xxv.—Tropic curvature with transverse transmission of effect of stimulus (assisted by G. Das). xxv .—Mechanotropism: twining of tendrils (assisted by G. Das). xxvii.—On galvanotropism (assisted by G. Das). xxviii.—On thermonastic phenomena (assisted by S. C. Das). xxix.—On phototropism. xxx.—Dia-phototropism and negative phototropism (assisted by G. Das). xxxi.—The relation between the quantity of light and the induced phototropic curvature (assisted by S. C. Das). xxxii.—The phototropic curve and its characteristics. xxxiii.—The trans-

mitted effect of photic stimulation (assisted by J. Sircar). xxxiv.—On photonastic curvatures (assisted by G. Das). xxxv.—Effect of temperature on phototropic curvature (assisted by G. Das). xxxvi.—On phototropic torsion (assisted by S. C. Das). xxxvii.—Radiothermotropism (assisted by G. Das). xxxviii.—Response of plants to wireless stimulation (assisted by G. Das). xxxix.—Geotropism. xl.—Geo-electric response of shoot (assisted by S. C. Guha). xli.—The mechanical and electrical response of root to various stimuli. xlii.—Geo-electric response of root (assisted by S. C. Guha). xliii.—Localization of geo-perceptive layer by means of the electric probe (assisted by S. C. Guha). xliv.—On geotropic torsion (assisted by G. Das). xlv.—On thermo-geotropism. xlvi.—Diurnal movements in plants. xlvii.—Diurnal movement due to alternation of light and darkness (assisted by L. M. Mukherji). xlviii.—Diurnal movement due to variation of temperature affecting growth (assisted by L. M. Mukerjee). xlix.—Daily movement in plants due to thermo-geotropism (assisted by L. M. Mukherji). l.—The after-effect of light (assisted by S. C. Das). li.—The diurnal movement of the leaf of *Mimosa*.—*F. S. Wolpert.*

2165. Massart, J. **Recherches sur les organismes inférieurs. VII. Les réflexes chez les Polyporées. [Reactions in the Polyporaceae.]** Acad. Roy. Belgique Bull. Cl. Sci. **1920**: 82–90. *10 fig.* 1920.—In the Polyporaceae one may recognize the reactions due to 3 causal stimuli as follows: (1) Light which intervenes in the production of the fruit body; (2) gravity in response to which the fungus differentiates its fruit body and orients the tubes of the hymenophore; and (3) contact which inhibits the growth of the hyphae.—*Henri Micheels.*

2166. Ricome, H. **Sur des phénomènes de torsion comparables à l'enroulement des vrilles provoqués expérimentalement. [The phenomena of torsion experimentally stimulated and comparable to the curling of tendrils.]** Compt. Rend. Acad. Sci. Paris **170**: 1399–1401. 1920.—Bean stems horizontally placed and fixed by two pins in the region of growth display a torsion between these pins of 180° in 24 hours. It occurs in darkness as well as light, but may be brought about by heliotropic instead of geotropic stimulation. It occurs in detached stems and also does not seem to be related to the distribution of nodes and internodes.—*C. H. Farr.*

TEMPERATURE RELATIONS

2167. Bigelow, W. D., and J. R. Esty. **The thermal death point in relation to time of typical thermophilic organisms.** Jour. Infect. Diseases **27**: 602–617. 1920.—A method is presented for determining the length of time, at different temperatures, necessary to completely destroy a definite known concentration of spores in a medium of known hydrogen-ion concentration. The time necessary decreases as the temperature increases and as the P_H value is increased; at a given reaction and temperature, the larger the number of spores present in the medium the longer is the time necessary to destroy them.—*Selman A. Waksman.*

RADIANT ENERGY RELATIONS

2168. Anonymous. **Putting plants on daylight rations.** Sci. Amer. **122**: 624, 634. *4 fig.* 1920.—There is described a recent discovery by W. W. Garner and H. A. Allard. **[Effect of the relative length of day and night and other factors of the environment on growth and reproduction in plants.** Jour. Agric. Res. **18**: 553–605. *Pl. 64–79, 35 fig.* 1920.—See Bot. Absts. 5, Entry 22] showing that too many hours of daylight in comparison with the number of hours of darkness will prevent many kinds of plants from flowering and fruiting.—*Chas. H. Otis.*

2169. Massart, J. **L'action de la lumière continue sur la structure des feuilles. [The action of continuous light on the structure of leaves.]** Acad. Roy. Belgique Bull. Cl. Sci. **1920**: 37–43. 1920.—The author repeated the experiments of Bonnier but with results contradictory to those of the latter.—For each species the author proceeded as follows: there were six lots of plants, entirely comparable, which were exposed respectively, (1) to continuous light; (2) to darkness; (3) to light during 12 hours and to darkness during 12 hours (one lot was

exposed from 7 to 19 hours, and the other from 19 to 7 hours with no difference whatever between the two lots); (4) to light from 7 to 13 hours and to darkness from 13 to 7 hours; and (5) to light from 13 to 7 hours and to darkness from 7 to 13 hours.—The experiments included the following species. Hepatics: *Conocephalus conicus, Lunularia cruciata, Marchantia polymorpha, M. emarginata, Pellia epiphylla, P. endiviaefolia.* Lycopodineae: *Selaginella helvetica.* Phanerogams: *Notoscordum fragrans, Sempervivum tectorum, Aegopodium Podagraria, Lysimachia Nummularia, L. Nummularia* var. *aurea, Vinca minor, Glechoma hederaceum, Ajuga reptans, A. reptans* var. *atropurpurea, Campanula persicifolia.*—Nothing was observed which showed the least difference between the effects of continuous and discontinuous illumination. In none was the structure or the form of the leaves developed in constant illumination similar at all to that of those produced in darkness. Illumination of 24 hours of the day, of 18 hours, of 12 hours, and of 6 hours act in general in the same manner upon the assimilatory organs. The influence of light upon the form and structure and also upon the production of chlorophyll depends therefore much more upon its intensity than upon its duration. In the majority of the experiments a light of 400 candle power at a distance of 1 meter was sufficient.—*Henri Micheels.*

2170. Negri, G. **Su un musco cavernicolo crescente nell'oscurità assoluta. [A moss growing in absolute darkness.]** Atti R. Accad. Lincei Roma Rend. (Cl. Sci. Fis. Mat. e Nat.) **V, 29**[1]: 159–162. 1920.—A moss identified as *Isopterigium Muellerianum* (Schor.) Lind. is described and reported to have been collected by Martino Maccagno in the grotto of Trebiciano (Triest) in the Lindner cavern at a depth of 275 meters. The entrance is so narrow and crooked that light does not penetrate to this depth. Other cases of plants growing in partial or complete darkness are reviewed.—*F. M. Blodgett.*

2171. Wiessmann, H. **Einfluss des Lichtes auf Wachstum und Nahrstoffaufnahme beim Hafer. [Influence of light on the growth and the absorption of nutrient salts in the oats.]** Landw. Jahrb. **35**: 183–190. 1919.—The difference in the light received by oat plants standing (1) on a roof and (2) in a court caused differences in yield and in the quantities of nutrient salts absorbed. The oats on the roof stooled better, had stronger stalks, blossomed and ripened earlier, and yielded more of both grain and straw than the plants in the court. The percentage of nitrogen, potash, and phosphoric acid was much greater in the plants grown in the more diffuse light, i.e., in the court, but the absolute amounts were much less.—*A. J. Pieters.*

TOXIC AGENTS

2172. Bertrand, Gabriel, et Mme. Rosenblatt. **Action de la chloropicrine sur quelques fermentations bactériennes. [The effect of chloropicrine on bacterial fermentations.]** Compt. Rend. Acad. Sci. Paris **170**: 1468–1471. 1920.—This is a study of lactic acid fermentation, ammoniacal fermentation, and the fermentation of sorbose in relation to the presence of chloropicrine. It was found that there is a distinct toxic effect which is comparable in some cases to that of the more powerful antiseptics.—*C. H. Farr.*

2173. Maquenne, et Demoussy. **Un cas d'action favorable du cuivre sur la végétation. [An instance of the favorable effect of copper on vegetation.]** Compt. Rend. Acad. Sci. Paris **170**: 1542–1545. 1920.—Lettuce, peas, and wheat were grown in culture solutions at low temperature and in weak light. Lettuce lived 33 days; wheat and peas 9 days. To other solutions copper sulphate was added to the extent of 0.02 to 0.2 mg. per liter. The presence of copper increased the length of life in all cases and the dry weight in some instances.—*C. H. Farr.*

2174. Medes, Grace, and J. F. McClendon. **Effect of anesthetics on various cell activities.** Jour. Biol. Chem. **42**: 541–568. 1920.—The plant used was *Elodea,* and the anesthetics, alcohol, ether, chloroform, and chloretone. The cell activities tested were (1) consumption of O_2, (2) liberation of CO_2 as measured by P_H changes in the solutions, (3) rotation of chloroplasts, (4) photosynthesis, (5) diffusion of chlorides from the cell. Increase or decrease in

the rate of activities is in comparison with the rate in water.—Consumption of O_2 increased in the following: alcohol, 1, 1.5, 3, and 6 per cent; ether, 1.5, 3, 5, and 8 per cent; chloroform, 0.05, 0.15, 0.3 per cent; and chloretone, 0.05 per cent. It decreased in 15 per cent alcohol and in 0.1 per cent chloretone.—The P_H value increased in all of the above solutions except in the 1 per cent alcohol and the 0.05 per cent chloroform, and in all cases the greatest change in P_H was in the highest concentration.—The rate of rotation of chloroplasts was increased in 1.5 and 3 per cent alcohol, and in 0.05 per cent chloroform. It was decreased in 6 per cent alcohol, 1.5 and 3 per cent ether, and in 0.05 per cent chloretone. It was completely stopped in 15 per cent alcohol, 5 and 8 per cent ether, 0.15 and 0.3 per cent chloroform, and in 0.10 per cent chloretone.—Photosynthesis was decreased in all strengths of alcohol, ether, and chloroform used, and stopped by the higher concentrations. It was unchanged in the strengths of chloretone used.—The diffusion of chlorides was unchanged in 1 per cent alcohol, but was greatly increased in all higher concentrations and by all other solutions used.—Plasmolysis was produced by 15 per cent alcohol, 8 per cent ether, and 0.30 per cent chloroform.—The amount of oxygen used increased through the lower concentrations of the anesthetic, reached a maximum in the solution just failing to cause permanent injury, and then decreased in those causing irreversible changes. Such an effect indicates that in respiration at least two separate processes must be involved.—Of all the cell processes photosynthesis seems to be the most readily affected by alcohol, ether, and chloroform; but as these are all well-known solvents of chlorophyll such a result is probably to be expected.—*G. B. Rigg.*

MISCELLANEOUS

2175. B., W. E. **American agricultural research.** [Rev. of: Jour. Agric. Res. **18**, Nos. 7 and 8. 1920.] Nature **105**: 310–311. 1920.—This review is of papers on physiological balance, seed treatment, and control of insects by parasites.—*A. A. Stevens.*

2176. Levine, B. S., and F. P. Veitch. **Testing the mildew resistance of textile.** Jour. Indust. Eng. Chem. **12**: 139–141. 1920.—A method to test the mildew resistance of textiles is described which is simple in execution and the details of which have been standardized.—*Henry Schmitz.*

SOIL SCIENCE

J. J. Skinner, *Editor*
F. M. Schertz, *Assistant Editor*

GENERAL

2177. Gardner, Willard. **The capillary potential and its relation to soil-moisture constants.** Soil Sci. **10**: 357–359. *1 fig.* 1920.—A discussion is given of Briggs' equations (U. S. Dept. Agric. Bur. Soils Bul. 45) and curves are drawn satisfying those equations.—*W. J. Robbins.*

2178. Nottin, P. **Sur le pouvoir absorbant de la terre vis-à-vis du manganèse. [On the absorbent power of the soil for manganese.]** Compt. Rend. Acad. Sci. Paris **171**: 44–47. 1920.

2179. Tamhane, V. A. **Comparison of salt lands in the Deccan and in Sind.** Agric. Jour. India **15**: 410–417. 1920.—The paper discusses the geological origin of the salt lands and compares the regions as to the immediate cause of the salt deposits. Chemical analyses of the soils, river waters, etc., which lead to the salt deposits are given. *Lathyrus sativus* and *Phaseolus radiatus* failed to grow in soil containing 0.48 per cent of soluble salts, 66 per cent of which was Na_2SO_4. Several crops have been found to resist the effects of soluble salts in concentrations beyond 0.1 per cent. The limit of tolerance shown by some of the common crops is tabulated. Rice was found to tolerate 940 parts of soluble salts per 100,000 of water.—*F. M. Schertz.*

2180. Weston, Robert Spurr. **By-products from sewage sludge.** Amer. Jour. Public Health 10: 405–409. 1920.—A discussion of the treatment of sewage from the standpoint of recovering by-products—chiefly fats and fertilizing materials. The Miles process is said to give the best study for such recovery. The claim is made "that many American sewages contain enough fats and fertilizer constituents to make the problem worth consideration." Additional experiments necessary to put the recovery on a profitable basis are suggested.—*C. A. Ludwig.*

INFLUENCE OF BIOLOGICAL AGENTS

2181. Greaves, J. E., and E. G. Carter. **Influence of moisture on the bacterial activities of the soil.** Soil Sci. 10: 361–386. *4 fig.* 1920.—The ammonification, nitrification, and nitrogen fixation of 22 soils at varying moisture contents were determined. The soils varied from a loose sand to a tight clay, from soils with little or no organic matter to soils high in organic matter. The moisture-holding capacities varied from 31 to 78 per cent. Every soil gave a maximum ammonification at a water content of 60 per cent of the moisture-holding capacity. Maximum nitrification occurred at 50–60 per cent. Nitrogen fixation in many soils showed two maxima, one at 50–60 and another at 70–80 per cent. Equations for the optimum water content for bacterial activities are given based on the formulae of Briggs for moisture equivalent, wilting coefficient, and hygroscopic coefficient.—*W. J. Robbins.*

2182. Hodgson, R. W. **Conservation in the use of manure.** Monthly Bull. Dept. Agric. California 8: 512–517. 1919.—Considerable loss of manure results through aerobic decay and fermentation both in the stable and in the orchard while in piles prior to distribution; 50–75 per cent of the nitrogen is lost. Urine should not be allowed to drain away. It seems desirable to plough down manure rather deeply, 12 to 15 inches, so that it lies in the vicinity of the feeding roots and undisturbed by constant cultivation. At that depth manure is unaffected by atmospheric conditions and has optimum conditions for transformation into available plant food.—*E. L. Overholser.*

2183. Joshi, N. V. **Studies in biochemical decomposition of cow-dung and urine in soils.** Agric. Jour. India 15: 398–409. 1920.—Non-nitrogenous manures (such as cellulose) lower the amounts of nitrates formed from organic manures. Urine gives the greatest amount of nitrates and nitrifies at once while cow-dung does not nitrify when fresh. Storage of sheep-dung and urine in a pit is not desirable because of nitrogen losses. CO_2 production and nitrification are not necessarily correlated.—*F. M. Schertz.*

2184. Russell, E. J. **The partial sterilization of soils.** Jour. Roy. Hort. Soc. 45: 237–246. 1919.—Tests of toluene, carbon bisulfide, carbolic acid, and formaldehyde as soil sterilizers in comparison with heating are reported, and a general discussion of soil protozoa is given.—*J. K. Shaw.*

FERTILITY STUDIES

2185. McFadzean, G. S. **Top dressing pasture lands.** Jour. Dept. Agric. Victoria 18: 408–412. *4 fig.* 1920.—Good results were secured by top dressing with superphosphate and bone meal in the Portland District. Clover and rye grass, the native grasses, have improved with the use of fertilizers and the pastures support a larger number of cattle.—*J. J. Skinner.*

2186. Norris, R. V. **The exhaustion of Indian soils and the methods by which this may be remedied.** Agric. Jour. India 15: 433–443. 1920.—Attention is called to the use of manurial substances which are now exported but may be used to a greater advantage at home.—*F. M. Schertz.*

2187. Rae, F. G. **Electro-culture.** Jour. Dept. Agric. Victoria 18: 385–394. 1920.—A review of experiments showing the effect of electric currents in soil on the growth of plants. The experiments cited show generally an increase.—*J. J. Skinner.*

2188. Williams, C. B., W. F. Pate, E. C. Blair, S. C. Clapp, and F. J. Meacham. **Relative value of acid phosphate and rock phosphate on North Carolina soils.** Bull. North Carolina Dept. Agric. 41[5]: 3–22. *Fig. 13.* 1920.—Relative availability is indicated by crop yields where acid phosphate or rock phosphate was used with either stable manure, lime, or the common mineral fertilizer elements.—*F. A. Wolf.*

2189. Wrangel, Margarete. **Ein estländisches Rohphosphat und seine Wirkung auf verschiedene Pflanzen. [An Esthonian raw phosphate and its effect upon various plants.]** Landw. Versuchssta. 96: 1–44. *Pl. 1–3.* 1920.—Comparisons of Esthonian phosphate with Thomas phosphate, appatite, phosphorite, staffelite, dicalcium and tricalcium phosphates show it to be more available than the other raw phosphates. Pot experiments conducted at Hohenheim showed that plants differ considerably in their ability to utilize raw phosphates. Mustard, buckwheat, clover, rape, and vetch showed best results. With these plants the Esthonian raw phosphate about equalled the Thomas phosphate. Rye, flax and maize showed little ability to utilize the raw phosphates.—*A. T. Wiancko.*

TAXONOMY OF VASCULAR PLANTS

J. M. Greenman, *Editor*
E. B. Payson, *Assistant Editor*

SPERMATOPHYTES

2190. Anonymous." **Decades Kewenses. Decas XCVI.** Bull. Misc. Inf. Kew 1920: 108–112. 1920.—The following species are described as new: *Miliusa dolichantha* Craib, *Vatica Shingkeng* Dunn, *Rubus Burkillii* Rolfe, *Eugenia arborensis* Dunn, *Begonia arborensis* Dunn, *B. Burkillii* Dunn, *B. iridescens* Dunn, *B. scintillans* Dunn, *Sadiria Boweri* Dunn, *Arundinella intricata* Hughes.—*E. Mead Wilcox.*

2191 Anonymous. **Decades Kewenses. Decas XCVII.** Bull. Misc. Inf. Kew 1920: 132–136. 1920.—The following species are described as new: *Rubus chambica* Rolfe, *Brassaiopsis magnifica* Dunn, *Ophiorhiza heterostyla* Dunn, *Psychotria arborensis* Dunn, *Agapetes marginata* Dunn, *A. nutans* Dunn, *Buddleia candida* Dunn, *Aeschynanthus monetaria* Dunn, *Rhinacanthus grandiflorus* Dunn, *Gomphostemma arborensis* Dunn.—*E. Mead Wilcox.*

2192. Anonymous. **New orchids: Decade XLVII.** Bull. Misc. Inf. Kew 1920: 128–132. 1920.—The following species are described as new: *Eulophia Huttonii* Rolfe, *E. Boltonii* Harv. & Rolfe, *Lissochilus Rehmannii* Rolfe, *L. transvaalensis* Rolfe, *Polystachya natalensis* Rolfe, *Phalaenopsis latisepala* Rolfe, *P. Micholitzii* Rolfe, *Angraecum Hislopii* Rolfe, *A. Bolusii* Rolfe, *Brownleea Fanniniae* Rolfe.—*E. Mead Wilcox.*

2193. Benoist, Raymond. **Descriptions d'espèces nouvelles de Phanérogames. [Descriptions of new species of Phanerogams.]** Bull. Mus. Hist. Nat. [Paris] 26: 184–188. 1920.—The following species are described as new to science: *Ononis zaiana, Bathysa difformis, Hypoestes longispica, H. capitata, H. multispicata, H. comosa,* and *H. oppositiflora.*—*E. B. Payson.*

2194. Britton, N. L., and J. N. Rose. **The Cactaceae, descriptions and illustrations of plants of the Cactus family.** Vol. II. *23 x 29 cm., 40 pl. (32 colored), 305 fig.* Carnegie Inst. Washington Publ. 248. Vol. II. Sept. 9, 1920.—The subtribes, *Cereanae* and *Hylocereanae* of the tribe *Cereeae,* are treated in this volume. Forty-seven genera and 276 species are recognized and are described fully with complete bibliography, type locality, distribution and list of previously published illustrations. There are 19 new genera, as follows: **Arrojadoa, Binghamia, Brachycereus, Browningia, Corryocactus, Deamia, Dendrocereus, Erdisia, Espostoa, Facheiroa, Jasminocereus, Leocereus, Machaerocereus, Mediocactus, Monvillea, Neoraimondia, Stetsonia, Wilmattea,** and **Zehntnerella.**—There are 48 new species, as follows: *Acanthocereus*

albicaulis, A. brasiliensis, A. colombianus, A. horridus, A. occidentalis, A. subinermis; Aporocactus Conzattii; Borzicactus Morleyanus; Cephalocereus barbadensis, C. brasiliensis, C. Gaumeri, C. Purpusii, C. Smithianus, C. Tweedyanus, C. Zehntneri; Cereus grenadensis; Facheiroa publiflora; Harrisia aboriginum, H. Earlei, H. fragrans Small, *H. Simpsonii; Hylocereus antiguensis, H. bronxensis, H. cubensis, H. venezuelensis; Lemaireocereus Cartwrightianus, L. Godingianus, L. humilis, L. longispinus, L. montanus; Leocereus bahiensis; Leptocereus Maxonii, L. prostratus, L. sylvestris; Monvillea diffusa, M. maritima; Myrtillocactus Eichlamii; Nyctocereus oaxacensis; Pachycereus Gaumeri; Selenicereus brevispinus, S. Murrillii; Trichocereus cuzcoensis, T. pachanoi, T. peruvianus, T. Shaferi; Weberocereus panamensis; Wilcoxia papillosa; Zehntnerella squamulosa.*—There are five new names, as follows: *Cephalocereus robustus, Cereus argentinensis, Erdisia Meyenii, Heliocereus elegantissimus,* and *Lemaireocereus Eichlamii.*—There are 92 new combinations, as follows: *Aporocactus Martianus; Arrojadoa penicillata, A. rhodantha; Binghamia acrantha, B. melanostele; Borzicactus acanthurus, B. aurivillus, B. decumbens, B. Humboldtii, B. icosagonus, B. plagiostoma, B. sepium; Brachycereus Thouarsii; Browningia candelaris; Cephalocereus arrabidae, C. catingicola, C. Dybowskii, C. euphorbioides, C. fluminensis, C. Gounellei, C. leucostele, C. Moritzianus, C. pentaedrophorus, C. phaeacanthus, C. piauhyensis, C. Robinii; Cleistocactus anguinus, C. smaragdiflorus; Corryocoactus brachypetalus, C. brevistylus, C. melanotrichus; Deamia testudo; Dendrocereus nudiflorus; Erdisia Philippii, E. spiniflora, E. squarrosa; Espostoa lanata; Eulychnia iquiquensis, E. spinibarbis; Harrisia adscendens, H. Bonplandii, H. Guelichii, H. Martinii, H. platygona, H. pomanensis, H. tortuosa; Heliocereus cinnabarinus; Hylocereus extensus, H. guatemalensis, H. monacanthos, H. polyrhizus, H. Purpusii; Jasminocereus galapagensis; Lemaireocereus Aragonii, L. chende, L. chichipe, L. deficiens, L. pruinosus; Leocereus Glaziovii, L. melanurus; Leptocereus Weingartianus; Machaerocereus Eruca, M. gummosus; Mediocactus coccineus, M. megalanthus; Monvillea amazonica, M. Cavendishii, M. insularis, M. phatnosperma, M. Spegazzinii; Neoraimondia macrostibas; Pachycereus lepidanthus, P. ruficeps; Selenicereus Donkelaarii, S. inermis, S. vagans, S. Wercklei; Stetsonia coryne; Trichocereus Bridgesii, T. candicans, T. chiloensis, T. coquimbanus, T. fascicularis, T. huascha, T. lamprochlorus, T. pasacana, T. Schickendantzii, T. strigosus, T. thelegonoides, T. thelegonus, T. Terscheckii;* and *Wilmattea minutiflora.*—In volume I, 8 genera and 302 species were recognized. There were: one new genus, **Tacinga;** 42 new species, *Nopalea Gaumeri; Opuntia aequatorialis, O. bahamana, O. bahiensis, O. bella, O. Boldinghii, O. borinquensis, O. brunnescens, O. burrageana, O. campestris, O. caribaea, O. depauperata, O. discolor, O. distans, O. Dobbieana, O. guatemalensis, O. Hickenii, O. ignota, O. juniperina, O. Macateei, O. militaris, O. mortolensis, O. palmadora, O. pascoensis, O. Pennellii, O. Pittieri, O. Russellii, O. Shaferi, O. Skottsbergii, O. Soederstromiana, O. Soehrensii, O. viridiflora, O. Wentiana, O. Wilcoxii; Pereskia colombiana, P. Conzattii, P. Moorei, P. Zehntneri; Pterocactus Fischeri, P. Hickenii, P. pumilus; Tacinga funalis;* one new name, *Opuntia pestifer;* three new combinations, *Grusonia Bradtiana, Maihuenia patagonica,* and *Pterocactus tuberosus.* [See Bot. Absts. 3, Entry 1824.]—*J. N. Rose.*

2195. Dammer, U. **Chelyocarpus Dammer nov. gen.** Notizbl. Bot. Gart. Berlin 7: 44–51. 1920.—**Chelyocarpus,** nov. gen., includes one new species of palm from Brazil, namely, *C. Ulei.* —*H. A. Gleason.*

2196. Fernald, M. L. **The American Ammophila.** Rhodora 22: 70–71. 1920.—The common Sand Reed, Marram, or Beach Grass, of the coastal sand dunes from the Straits of Belle Isle to North Carolina, and of the St. Lawrence system inland to Lake Superior, which has been universally identified with *Ammophila arenaria* of the western and southern coasts of Europe, is a distinct species, here published as *Ammophila breviligulata.* The distinguishing characters of the two species and the geographic distribution of the latter are discussed.—*James P. Poole.*

2197. Fernald, M. L. **Juncus Gerardi Loisel., var. pedicellatus.** Rhodora 22: 76. 1920.—A new variety, differing from the typical *J. Gerardi* in its large flowers and elongated pedicels, collected on the coast from Maine to Rhode Island.—*James P. Poole.*

2198. Fernald, M. L. **A new Digitaria from New Hampshire.** Rhodora 22: 101–104. 1920.—The plant discovered by the late F. W. Batchelder in northeastern Hillsboro County, New Hampshire, in 1901, and distributed to various herbaria by the collector as *Syntherisma filiforme* (L.) Nash, is quite distinct from the latter and is published as *Digitaria laeviglumis* n. sp. The author gives a list of transfers found necessary in organizing the North American material of *Digitaria* in the Gray Herbarium, noting the synonomy involved in each case.—*James P. Poole.*

2199. Fernald, M. L. **Oxalis montana.** Rhodora 22: 143–144. 1920.—The author previously pointed out (Rhodora 20: 76–78. 1918) several characters by which the northern wood sorrel of eastern America differs from the Old World *O. acetosella* L., and took up for the American plant the name *O. americana* Bigelow (1824). He now finds that this plant had been properly named by Rafinesque in 1818 and therefore should be known as *O. montana* Raf. The following new combination is made: *O. montana* Raf. forma *rhodantha* (*O. americana* Bigelow forma *rhodantha* Fernald).—*James P. Poole.*

2200. Fernald, M. L. **Pyrola rotundifolia and P. americana.** Rhodora 22: 121–123. 1920.—In a former paper (Rhodora 4: 201. 1904) the author pointed out the distinctions between the northern Eurasian *Pyrola rotundifolia* L. and the Alleghenian *P. americana* Sweet. More recent material from Newfoundland bridges somewhat the gap between the two plants. These Newfoundland plants seem to be inseparable from the Eurasian *P. rotundifolia* L., var. *arenaria* Mert. & Koch, the latter differing in no morphological character from the continental and more southern *P. americana* Sweet. The Newfoundland plant is now published as *P. rotundifolia* L. var. *arenaria* Mert. & Koch, and the continental form, distributed from Nova Scotia westward to Minnesota and South Dakota and southward to Georgia, becomes *P. rotundifolia* L. var. *americana* (Sweet) n. comb.—*James P. Poole.*

2201. Gagnepain, F. **Aetheocephalus, nouveau genre de Composées. [Aetheocephalus, a new genus of the Compositae.]** Bull. Mus. Hist. Nat. [Paris] 26: 172–173. 1920.—*A. Thorelii* is published as the representative of a new genus previously recognized by Thorel in manuscript only. This plant of southeastern Asia is placed in the tribe *Helianthoideae* and subtribe *Coreopsideae.*—*E. B. Payson.*

2202. Gamble, J. S. **The flora of Madras III.** Bull. Misc. Inf. Kew 1920: 49–57. 1920.—A collection of miscellaneous notes on various species included in the 3rd part of the "Flora of Madras" intended to supplement that work. The following new combinations are made: *Syzygium Fergusoni* (*Eugenia Fergusoni* Trim.), *S. olivifolium* (*Eugenia olivifolia* Duthie).—*E. B. Payson.*

2203. Godfery, M. J. **Cephalanthera Richard or Epipactis Crantz?** Jour. Botany 58: 69–74. 1920.—The author takes exception to R. von Wettstein's treatment of *Cephalanthera, Epipactis,* and *Limodorum* in which these three genera are united. Wettstein criticised the work of Richard, Reichenbach, and Bentham and Hooker, attempting to show that the characters used by them were overdrawn, and in many cases were not of a basic nature. Godfery holds that Wettstein himself was in error, and that these characters proposed by the older authors are sufficient to warrant the retention of the three genera. The characters under discussion relate to the presence or absence of a rostellum, single or tetrad pollen, shape of the stigma, shape of the anther, and degree of divergence of the perianth. One species, *C. cucullata* which Wettstein considers transitional Godfery believes to be a probable bigeneric hybrid of *Cephalanthera* and *Limodorum.* The author suspects that Wettstein was prejudiced by his bias against the probability of the occurrence of bigeneric hybrids.—*K. M. Wiegand.*

2204. Godfery, M. J. **Orchids of Hants and Dorset.** (Abstract.) Rept. British Assoc. Adv. Sci. 1919: 331. 1920.

2205. Guillaumin, A. **Contribution à la flore de la Nouvelle-Calédonie. [Contribution to the flora of New Caledonia.]** Bull. Mus. Hist. Nat. [Paris] 26: 174–179. 1920.—In continuation of his series of similar papers on the flora of New Caledonia the author gives a list of plants collected by M. and Mme. LeRat. The following new names and species new to science are proposed: *Oxalis neo-caledonica*, *Melicope LeRatii*, *M. Balansae* (*Evodia Balansae* Baill. mss.), *M. leptococca* (*Evodia leptococca* Baill. mss.), *M. Veillardi* Baill. mss. (*Evodia Vieillardi* Baill.), *M. lasioneura* Baill. mss. (*Evodia lasioneura* Baill.), *Evodia pseudo-obtusifolia*, *Polyosma LeRatii*, *P. Pancheriana* Baill. var. *subintegrifolia*, *Myrtus supra axillaris*, *Litsea uniflora*, and *L. triflora*.—*E. B. Payson.*

2206. Harms, H. **Drei neue Mucuna-Arten aus Papuasien. [Three new species of Mucuna from Papuasia.]** Notizbl. Bot. Gart. Berlin 7: 28–30. 1920.—*Mucuna amblyodon*, *M. Peekelii*, and *M. Schlechteri* are described as new.—*E. B. Payson.*

2207. Harms, H. **Eine neue Gattung der Leguminosae-Papilionatae aus Papuasien. [A new genus of Papilionaceae from Papuasia.]** Notizbl. Bot. Gart. Berlin 7: 26–27. 1920. The genus **Peekelia** is erected to include *Phaseolus papuanus* Pulle.—*H. A. Gleason.*

2208. Hitchcock, A. S., and Agnes Chase. **Revisions of North American grasses.** Contrib. U. S. Nation. Herb. 22: 1–77. *Pl. 1–24*, *fig. 1–20*. 1920.—Under this title are published revisions of four genera of grasses of the tribe *Paniceae*. The first, by A. S. Hitchcock, treats of the North American species of *Ichnanthus*. Ten species are described, all but one illustrated by photographs of specimens. The second, by the same author, is a revision of the fifteen known species of *Lasiacis*, all American, each of which is represented by a photograph of a specimen. One new species, *Lasiacis leptostachya* Hitchc. from Nicaragua, is described. The third paper, by Agnes Chase, discusses the North American species of *Brachiaria*, a genus which, unlike most of the *Paniceae*, belongs primarily to the Old World. Six species are described, each illustrated by figures showing part of the inflorescence, anterior and dorsal views of a spikelet, and the fruit. One new species, *Brachiaria ophryodes* Chase, from Mexico, is described, and the following new combinations occur; *Brachiaria Gilesii* (Benth.) Chase, *B. miliiformis* (Presl) Chase, and *B. ciliatissima* (Buckl.) Chase, only the last referring to a North American species. The fourth paper, by Mrs. Chase, treats of the North American species of *Cenchrus*, 13 species being described and illustrated by figures of the burs and of the spikelets. The name *Cenchrus carolinianus* Walt., which has figured in the literature for some years, is regarded as unidentifiable.—*S. F. Blake.*

2209. Johansson, K. **Nya Hieracia silvaticiformia från Sverges låglad. [New Hieracia silvaticiformia from the lowlands of Sweden.]** [Swedish.] Bot. Notiser [Lund] 1920: 65–100. 1920.—The article contains descriptions of 30 new species, and varieties, or new combinations, named by the author, or by G. Samuelsson, or by both conjointly.—*P. A. Rydberg.*

2210. Knuth, R. **Oxalidaceae americanae novae. [New American Oxalidaceae.]** Notizbl. Bot. Gart. Berlin 7: 289–318. 1919.—Under the sections to which they belong are described and listed the following new species, new varieties, new combinations, and new names: *Oxalis mairaryensis*, *O. nigricans* Pohl var. *diversifolia*, *O. glaucifolia*, *O. ramulosa*, *O. chanduyensis*, *O. coarctata*, *O. erosa*, *O. Lindheimeri* Torr., *O. yucatensis* (*Lotoxalis yucatensis* Rose), *O. glabrata* (*O. Neaei* var. *glabrata* Baker), *O. Hilaireiana*, *O. pulchriflora*, *O. Progelii* (*O. comosa* Prog.), *O. maracayuensis*, *O. tenuicalyculata*, *O. tenuicalyculata* var. *glabra*, *O. tenuicalyculata* var. *hirsuta*, *O. anthyllidifolia*, *O. anthyllidifolia* var. *acuta*, *O. anthyllidifolia* var. *obtusa*, *O. Hassleri*, *O. alta*, *O. ovalis* Ruiz, *O. piauhyensis*, *O. candicans*, *O. hirsutissima* Mart. & Zucc. var. *rotundata*, *O. hirsutissima* var. *oblonga*, *O. hirsutissima* var. *gracilior*, *O. cordifolia*, *O. tristis*, *O. renifolia*, *O. diamantinae*, *O. robusta* (*Monoxalis robusta* Rose), *O. fritillariiformis*, *O. fruticosa*, *O. novae caledoniae* Knuth & Schlechter, *O. pubescens* HBK. var. *glandulosa*, *O. Saulierei*, *O. subintegra*, *O. tabaconasensis*, *O. Niederleinii*, *O. texana* (*Xanthoxalis texana* Small), *O. corniculata* L. var. *sericea*, *O. corniculata* var. *macrophylla*, *O. corniculata* var. *serpens*, *O. interior* (*Xanthoxalis interior* Small), *O. colorea* (*Xanthoxalis colorea*

Small), *O. californica* (*Xanthoxalis californica* Abrams), *O. uruguayensis* (*Acetosella amara* var. *glandulosa*), *O. petrophila*, *O. parvifolia* DC. var. *pluriflora*, *O. cordobensis*, *O. cordobensis* var. *typica*, *O. cordobensis* var. *humilior*, *O. famatinae*, *O. contracta*, *O. patula*, *O. inflata*, *O. bartolomensis*, *O. cuzcensis*, *O. chosicensis*, *O. fernandensis*, *O. Besseri*, *O. chilensis*, *O. geranioides*, *O. parva*, *O. Hauthalii*, *O. juninensis*, *O. Güssfeldtii*, *O. riojana* Hieron., *O. bulbigera*, *O. solarensis*, *O. mercedensis*, *O. sorianensis*, *O. subviscosa*, *O. Schickendantzii*, *O. Taguetii*, *O. Smalliana* (*O. macra* Small), *O. hupehensis*, *O. Cunninghamii*, *O. frigida*, *O. pudica*, *O. elegantula*, *O. Lindneri*, *O. tubaraensis*, *O. bulbifera*, *O. yacutulensis*, *O. atroglandulosa*, *O. Niederleiniana* Hieron., *O. pinguiculacea*, *O. hyalinorhiza* Poepp., *O. fluminensis*, *O. bermejensis*, *O. carminea*, *O. argentina* (*O. bipartita* var. *alpina* Griseb.), *O. catamarcensis*, *O. multipes*, *O. pearsallensis*, *O. ramonensis*, *O. Ehrenbergii*, *O. efoliata*, *O. morelosensis* (*Ionoxalis bipartita* Rose), *O. intermedia* (*O. intermedia* A. Rich.), *O. stipulata* Rose (*Ionoxalis stipitata* Rose), *O. amplifolia* (*O. divergens* var. *amplifolia* Trel.), *O. angulata* (*Ionoxalis angulata* Small), *O. calcarea* (*Ionoxalis calcarea* Small), *O. immaculata* (*Ionoxalis immaculata* Small), *O. macrocarpa* (*Ionoxalis macrocarpa* Small), *O. leonis* (*Ionoxalis madrensis* Rose), *O. Metcalfei* (*Ionoxalis Metcalfei* Small), *O. neo-mexicana* (*Ionoxalis monticola* Small), *O. mucronata* (*Ionoxalis mucronata* Rose), *O. obliqua* (*Ionoxalis obliqua* Rose), *O. quadriglandula* (*Ionoxalis quadriglandula* Rose), *O. hidalgensis* (*Ionoxalis rupestris* Small), *O. Seatoni* (*Ionoxalis Seatoni* Rose), *O. trinervia* (*Ionoxalis trinervia* Rose), *O. vallicola* (*Ionoxalis vallicola* Rose), *O. alpina* Rose (*Ionoxalis alpina* Rose), *O. tepicensis* (*Ionoxalis compacta* Rose), *O. gregaria* Rose (*Ionoxalis gregaria* Rose), *O. primavera* (*Ionoxalis primavera* Rose), *O. Pringlei* Rose (*Ionoxalis Pringlei* Rose), *O. stolonifera* (*Ionoxalis stolonifera* Rose), *O. tenuiloba* (*Ionoxalis tenuiloba* Rose), *O. crassiscaposa*, *O. cobanensis*, *O. pseudo-tetraphylla*, *O. tlalpamensis*, *O. caerulea* (*Ionoxalis caerulea* Small), *O. Hayi* (*Ionoxalis divaricata* Small), *O. lanceolata* (*Ionoxalis lanceolata* Small), *O. macilenta* (*Ionoxalis macilenta* Small). *O. magnifica* (*Ionoxalis magnifica* Rose), *O. multiceps* (*Ionoxalis multiceps* Small), *O. Nelsonii* (*Ionoxalis Nelsonii* Small), *O. oaxacana* (*Ionoxalis oaxacana* Rose), *O. Painteri* (*Ionoxalis Painteri* Rose), *O. Rosei* (*Ionoxalis Rosei* Small), *O. scopulorum* (*Ionoxalis scopulorum* Rose), *O. tenuissima* (*Ionoxalis tenuissima* Rose), *O. trientalis* (*Ionoxalis trientalis* Small), *O. trineuris* (*Ionoxalis trineuris* Small), *O. confusa* (*Ionoxalis confusa* Rose), *O. Conzattiana* (*Ionoxalis Conzattiana* Rose), *O. cuernavacana* (*Ionoxalis cuernavacana* Rose), *O. furcata* Rose (*Ionoxalis furcata* Rose), *O. Gonzalesii* (*Ionoxalis Gonzalesii* Rose), *O. Grayi* (*Ionoxalis Grayi* Rose), *O. jaliscana* Rose (*Ionoxalis jaliscana* Rose), *O. zacatecasensis* (*Ionoxalis occidentalis* Rose), *Biophytum somnians* (*Oxalis somnians* Mart. & Zucc.), *B. lindsaeifolium* (*Oxalis lindsaefolia* Hook.), *B. dormiens* (*Oxalis dormiens* Mart. & Zucc.), *B. columbianum*, *B. antioquiense*, *B. casiquiarense* and *B. Passargei*.—*H. A. Gleason.*

2211. Kränzlin, F. **Orchidaceae Kalbreyerianae I.** Notizbl. Bot. Gart. Berlin 7: 412–451. 1920.—The following new species of orchids are described from the collections of Kalbreyer in Colombia: *Microstylis longissima*, *M. Kalbreyeriana*, *Chondrorhyncha macronyx*, *Ornithidium strictissimum*, *O. heterobulbon*, *O. olivaceum*, *Camaridium luteo-brunneum*, *Maxillaria gymnochila*, *M. laracina*, *M. diamantensis*, *M. convencionis*, *M. erubescens*, *M. podochila*, *M. antioquiana*, *M. amblyantha*, *M. Mathewsii*, *Ponera caricalensis*, *Rodriguezia antioquiana*, *Lycaste farinosa*, *Eriopsis Mesae*, *Batemania antioquiana*, *Zygopetalum Kalbreyerianum*, *Warrea medellinensis*, *Trichopilia concepcionis*, *Brachtia brevis*, *B. minutiflora*, *Mormodes convolutum*, *Rodriguezia cuentillensis*, *Houlletia Kalbreyeriana*, *Jonopsis zebrina*, *Epidendrum polystachyoides*, *E. microdendron*, *E. subtorquatum*, *E. Sierrae Peladae*, *E. magnibracteum*, *E. latibracteum*, *E. bucararicense*, *E. filamentosum*, *E. stenopetaloides*, *E. kalloneuron*, *E. festucoides*, *Diothonaea hemisclerioides*, *Chloraea sobralioides*, *Sobralia micrantha*, *Bletia candida*, and *Elleanthus longibracteatus*.—*H .A. Gleason.*

2212. Kränzlin, F. **Zwei neue und eine kritische Orchidacee. [Two new and one critical species of orchids.]** Notizbl. Bot. Gart. Berlin 7: 319–322. 1919.—Author discusses *Vanilla odorata* Presl and describes *Vanilla Preussii* n. sp. from Guatemala, and **Dikylikostigma** gen. nov. with one species, *D. Preussii*, from Venezuela.—*H. A. Gleason.*

2213. Krause, K. **Ueber die Gattungen Camptopus Hook. f. und Megalopus K. Sch.** [**The genera Camptopus and Megalopus.**] Notizbl. Bot. Gart. Berlin 7: 36–43. 1920.—The older name *Camptopus* has priority for this group of four African Rubiaceous species, and evidence is presented for continuing their generic separation from *Cephaelis*. An analytical key is given and two new species described.—*H. A. Gleason.*

2214. Lacaita, C. C. **The home of Inula Helenium.** Jour. Botany 58: 21–22. 1920.—This plant has been cultivated from time immemorial in various parts of Europe. Linnaeus in "Species Plantarum" mentions only England and Belgium as its habitat. Beck von Mannagetta has asserted that the plant is native in middle Asia and not in Europe. The author takes exception to this, and cites cases in Greece, Macedonia and Italy where it must be native. Trotter and Romano, from their experience in Italy, are cited as also taking exception to Beck's statement.—*K. M. Wiegand.*

2215. Lecomte, Henri. **Deux espèces nouvelles du genre Crateranthus (Lecythidacées).** [**Two new species of the genus Crateranthus (Lecythidaceae).**] Bull. Mus. Hist. Nat. [Paris] 26: 68–71. 1920.—Two species of *Crateranthus*, *C. Le Testui* and *C. congolensis*, are described as new to science and are contrasted by means of a key with the single species previously known.—*E. B. Payson.*

2216. Lester-Garland, L. V. **The botany of the Moroccan Middle Atlas.** Jour. Botany 58: 97–101. 1920.—A list is given of the plants collected by Captain Hubert Lynes during the summer of 1919. These plants all came from the middle zone of the range between 4000 and 6000 feet altitude. In the list they are divided into four groups: (1) Those reaching middle or north Europe; (2) widespread Mediterranean species; (3) west Mediterranean species; and (4) species endemic in Morocco or the Atlas. The relation of the Atlas flora to that of the hill districts of Central Europe is noted. The principal literature on the flora of the Atlas Mts. is listed. Special notes are given on *Potentilla hispanica* Zimm., *Cytisus Battandieri* R. Maire, *Erythraea major* Hoffm. & Link, and *Veronica ? rosea* Desf.—*K. M. Wiegand.*

2217. Loesener, T. **Über eine neue Stromanthe-Art.** [**A new species of Stromanthe.**] Notizbl. Bot. Gart. Berlin 7: 410, 411. 1920.—*Stromanthe humilis* Loes., from tropical America.—*H. A. Gleason.*

2218. Maiden, J. H. **A critical revision of the genus Eucalyptus.** Vol. V, Part 1. *1–25, pl. 168–171.* William Applegate Gullick: Sydney, June, 1920.—The present part contains descriptions, notes, and illustrations of the following species and varieties: *Eucalyptus latifolia* F. v. M., *E. Foelscheana* F. v. M., *E. Abergiana* F. v. M., *E. pachyphylla* F. v. M., *E. pachyphylla* F. v. M., var. *sessilis* var. nov., *E. pyriformis* Turcz. var. *Kingsmilli* Maiden, *E. Oldfieldii* F. v. M., and *E. Drummondii* Benth. *Ibid.* Part 2. *27–70, pl. 172–175.* 1920.—This part continues the revision with a similar treatment of the following species: *Eucalyptus eximea* Schauer, *E. peltata* Benth., *E. Watsoniana* F. v. M., *E. trachyphloia* F. v. M., *E. hybrida* Maiden, *E. Kruseana* F. v. M., *E. Dawsoni* R. T. Baker, *E. polyanthemos* Schauer, *E. Baueriana* Schauer, *E. conica* Deane & Maiden, and *E. concolor* Schauer.—*J. M. Greenman.*

2219. Maiden, J. H. **The forest flora of New South Wales.** Vol. VII. Part 3. *77–121, pl. 236–239, 11 photographic reproductions.* William Applegate Gullick: Sydney. March, 1920.—Five species are herein discussed, namely, *Brachychiton populneum* R. Br., *Eucalyptus rubida* Deane & Maiden, *Acacia Oswaldi* F. v. M., *A. neriifolia* A. Cunn., and *Harpullia pendula* Planch. Since *Eucalyptus rubida* is the main source of the Australian manna the author presents a general discussion on manna in an appendix. *Ibid.* Part 4. *123–191, pl. 240–243, 20 photographic illustrations.* William Appleton Gullick: Sydney. 1920.—The present part contains descriptions, detailed notes and illustrations of the following species: *Pittosporum undulatum* Vent., *Eucalyptus viminalis* Labill., *E. Dalrympleana* Maiden n. sp., *Acacia stenophylla* A. Cunn., *A. coriacea* DC., *Geijera salicifolia* Schott, and *G. parviflora* Lindl. An appendix is added in which the author gives a discussion of "Phenology: a form of nature study with very practical applications."—*J. M. Greenman.*

2220. Mildbraed, J. **Paraphyadanthe Mildbr. nov. gen. Flacourt. Ein interessanter Fall von "Rhizanthie" aus Kamerun. [Paraphyadanthe Mildbr., a new genus of Flacourtiaceae. An interesting case of "rhizanthy" from Kamerun.]** Notizbl. Bot. Gart. Berlin 7: 399–405. *Fig. A–O.* 1920.—The new genus **Paraphyadanthe,** with two species and one variety, produces flagelliform runners from the base of the trunk which extend to a distance of 10 meters or more along the surface of the ground, bear scale-like leaves, and produce the flowers either directly or at the summit of erect scaly branches. The vegetative portion of the plant is a small tree, up to 9 m. high. The genus is closely related to *Oncoba* and *Xylotheca.* The following are the new species and variety described: *P. flagelliflora, P. flagelliflora* var. *hydrophila,* and *P. coriacea.*—*H. A. Gleason.*

2221. Moore, Spencer Le M. **Alabastra diversa.—Part XXXII.** Jour. Botany 58: 74–80. 1920 (cont. from Jour. Bot. 57: 91. 1919).—3. *Plantae Rogersianae.—V.* Under the Leguminosae thirteen species, subspecies and varieties are treated, the following being new: *Crotalaria cataractarum* Baker fil., South Rhodesia; *C. acervata* Bak. fil., Belg. Congo; *C. macrotropis* Bak. fil., Belg. Congo; *C. rigidula* Bak. fil., North Transvaal; *C. homalocarpa* Bak. fil., S. Rhodesia; *C. longistyla* Bak. fil., S. Rhodesia; *C. Harmsiana* Taub. var. *congoensis* Bak. fil., Belg. Congo; *Indigofera gonioides* Hochst. var. *rhodesica* Bak. fil., S. Rhodesia; *I. dimidiata* Vog. var. *laxior* Bak. fil., Transvaal; and *I. Burkeana* Benth. form. All the new species of *Crotalaria* belong to the section Eucrotalaria. The Leguminosae were elaborated by Edmund Baker. Under the Compositae four species are treated of which the following are proposed as new: *Stoebe Mossii,* Cape Colony; *S. affinis,* Cape Colony; *Metalasia Rogersii,* South Africa. Under the Convolvulaceae notes are given on *Merremia kentrocaulos* Rendle var. *pinnatifida* N. E. Br. In the Solanaceae, *Solanum Rogersii* is described as new. 4. *Phyllanthi ex Rhodesia species nova. Phyllanthus Eylesii* is proposed as new. 5. *Acanthaceae Papuanae a cl H. O. Forbes lectae.* Nine species are listed and the n. comb. *Graptophyllum Gilligani* (= *Justicia Gilligani* Bail.) is made.—*K. M. Wiegand.*

2222. Osterhout, Geo. E. **A new Oreocarya from Colorado.** Bull. Torrey Bot. Club 47: 211. 1920.—*Oreocarya procera* from Glenwood Springs, Colorado, is described as a new species.—*P. A. Munz.*

2223. Pennell, Francis W. **Soil preferences of Scrophulariaceae.** Torreya 20: 10–11. 1920.—Instead of the expression "potassic soil," used by the author in his published studies of the Scrophulariaceae, "non-calcareous and non-magnesium soil" should be substituted. The chemical composition of soils and its relation to plant-distribution demand the attention of field-botanists.—*J. C. Nelson.*

2224. Pilger, R. **Gramineae austro-americanae imprimis Weberbauerianae. V.** Bot. Jahrb. 56 (Beibl. no. 123): 23–30. 1920 (cont. from Bot. Jahrb. 42: 50–72. 1906).—Report on grasses collected by Dr. A. Weberbauer in Peru, Ecuador, Bolivia, Argentina, Brazil, etc. The following species, varieties and names are proposed as new: *Stipa depauperata,* and vars. *glabrata* and *humilis, S. Hans-Meyeri, S. Hieronymusii, S. pachypus, Oryzopsis riqidiseta, O. Neesii,* (*Piptatherum obtusum* Nees), *Piptochaetium laeve* (*Piptatherum laeve* Nees), *Sporobolus mirabilis, Eragrostis carazensis, Dissanthelium minimum, Poa gymnantha, Arundinaria simpliciuscula, Chusquea sandiensis* (*C. ramosissima* Pilger), and *C. huantensis.* —*K. M. Wiegand.*

2225. Radlkofer, L. **Gesamtübersicht über die Sapindaceen Papuasiens. [Survey of the Sapindaceae of Papuasia.]** Under the general heading: C. Lauterbach. **Beiträge zur Flora von Papuasien. VII.** Bot. Jahrb. 56: 251–316. *4 fig.* 1920.—The limits of Papuasia are outlined, and it is noted that of the 14 tribes in the Sapindaceae only three are not represented,—Sapindeae, Koelreuterieae, and Cossignieae. Tribes Paullinieae and Thouinieae are mainly American, while Tribe Aphanieae is almost entirely Asian and Papuasian. The range of the other tribes is given, together with the size and general distribution of the noteworthy genera in each. The total number of genera represented is 26. Sixteen of these

are of oceanic and 9 of Asiatic distribution. The discussion of the geographical distribution is very extended. A special discussion of the genus *Majidea* Kirk is appended. Keys are given to the genera, and under each genus to the species. Nomenclatorial references, synonomy, and notes on distribution and structure are given under the species. The following new forms, species, and combinations are proposed: *Aphania dictyophylla* (*Cupaniopsis dictyophylla* Radlk.), *Lepisanthes membranifolia* (*Erioglossum membranifolia* Radlk.), *Guioa subsericea, G. dasyantha, G. pauciflora, Cupaniopsis grosseserrata, G. brachythyrsa, G. multidens, C. oxypetala, C. atrotheca, C. gigantophylla, C. flaccida, Rhysotoechia elongata, Dictyoneura subhirsuta, D. microcarpa, Euphorianthus pallidus, Sarcopteryx rigida, Jagera serrata* forma *genuina* and forma *fulvinervis, J. macrophylla, Arytera densiflora, A. sordida, A. xanthoneura, Mischocarpus retusus, M. largifolius, Harpullia reticulata, H. largifolia, H. obscura,* and *H. petiolaris.*—*K. M. Wiegand.*

2226. Rehder, Alfred. **The American and Asiatic species of Sassafras.** Jour. Arnold Arboretum 1: 242–245. 1920.—The taxonomic value of some of the characters used in the separation of genera in Lauraceae is discussed and a revised generic description of Sassafras given to include the two Asiatic species. *Sassafras randaiense* (*Lindera randaiensis* Hayata) appears as a new combination.—*Alfred Rehder.*

2227. Rehder, Alfred. **New species, varieties and combinations from the herbarium and collections of the Arnold Arboretum.** Jour. Arnold Arboretum 1: 254–263. 1920.—The present continuation of this paper deals chiefly with Rosaceae and a few Saxifragaceae and Hamamelidaceae. Besides some new horticultural forms the following new species, new varieties, and new combinations appear: *Ribes Ruizii, Parrotiopsis Jacquemontiana* (Decne.), *Hamamelis vernalis* f. *tomentella, Physocarpus australis* (Rydb.), *P. stellatus* (Rydb.), *Neillia longeracemosa* var. *lobata, N. sparsiflora, Spiraea prunifolia* var. *hupehensis* (Rehd.), *S. Schochiana* and *S. Teniana,* both from China, *S. virginiana* var. *serrulata, Holodiscus franciscanus* (Rydb.), *Pyracantha discolor, P. Koidzumii* (Hayata), *Crataegomespilus Gillotii* (G. Beck), and *Sorbus Harrowwiana* (Balfour).—*Alfred Rehder.*

2228. Ridley, H. N. **New and rare species of Malayan plants.** Jour. Straits Branch Roy. Asiatic Soc. 82: 167–204. 1920.—An account of some novelties collected of recent years together with various corrections and emendations of the Malayan flora based on an examination of types at Kew and the British Museum. Seventy-six new species are described and 3 new genera, the latter being **Peniculifera** (Sterculiaceae), **Leptonychiopsis** (Sterculiaceae) and **Napeodendron** (Sapindaceae).—*T. F. Chipp.*

2229. Rock, Joseph F. **The leguminous plants of Hawaii.** Experiment Station of the Hawaiian Sugar Planters' Association. *Roy. 8vo, 234 p., 93 pl.* Honolulu, July, 1920.—The 200 species included in this paper belong to 71 genera and are either native to the islands, have become well established there, or give promise of becoming permanent inhabitants. The percentage of indigenous species is exceedingly small. Keys to the genera and species are given as well as specific descriptions, synonyms, and notes regarding economic importance and local occurrence. The following new varieties are described and new combinations made: *Erythrina fusca* Lour. var. *inermis, Mucuna pachylobia* (*Stizolobium pachylobium* Piper & Tracy), *Dioclea altissima* (*Dolichos altissimus* Velloso), *Vigna sandwicensis* A. Gray var. *heterophylla.*—*E. B. Payson.*

2230. Rydberg, P. A. **Henry and Flood's the Douglas fir.** [Rev. of: Henry, Augustine, and Margaret G. Flood. The Douglas firs: a botanical and silvicultural study of the various species of Pseudotsuga. Proc. Roy. Irish Acad. B. 35: 67–92. *Pl. 12–14.* May, 1920. See Bot. Absts. 4, Entry 1544.] Torreya 20: 102–104. 1920.—Three species and one variety of *Pseudotsuga* native to North America are admitted, viz: *P. Douglasii* Carrière from the Pacific Coast region and the var. *caesia* Schwerin from the northern Rocky Mountains; *P. glauca* Mayr. from the Rocky Mountains; and *P. macrocarpa* Mayr. from Southern California. The reviewer considers the var. *caesia* as more related to *P. glauca* than to *P.*

Douglasii, and probably to be rather regarded as a distinct species. Four species native to China and Japan are also described. A comparison is made as to difference in odor, minute anatomy of the leaves, and composition of the oil distilled from the leaves.—*J. C. Nelson.*

2231. Rydberg, Per Axel. **Notes on Rosaceae—XII.** Bull. Torrey Bot. Club 47: 45–67. 1920.—A discussion is given of the 33 species of roses of northeastern North America, with key to groups and with notes on each species. These notes supplement the material given by the same author in the "North American Flora." Nineteen hybrids are also reported.—*P. A. Munz.*

2232. Sargent, C. S. **Notes on North American trees. VI.** Jour. Arnold Arboretum 1: 245–254. 1920.—*Hamamelis macrophylla* Pursh is taken up as a distinct species and the following new species of *Crataegus* described or new names proposed, and some reduced to varietal rank: *Crataegus montivaga, C. Cocksii, C. meridionalis, C. noelensis, C. rufula, C. drymophila, C. aestivalis* var. *maloides, C. aestivalis* var. *cerasoides, C. aestivalis* var. *cerasoides* f. *luculenta, C. Holmesiana* var. *tardipes, C. pedicellata* var. *gloriosa.*—*Alfred Rehder.*

2233. Schlechter, R. **Die Columelliaceae.** Notizbl. Bot. Gart. Berlin 7: 8–14. 1920.—The family is best placed near the Gesneriaceae. An analytical key and descriptions are given of the 6 species of *Columellia*, and a new species, *C. Weberbaueri* Schltr., is described from Peru.—*H. A. Gleason.*

2234. Schlechter, R. **Tetradema Schltr., ein neues Genus der Gesneriaceen. [A new genus of Gesneriaceae,]** Notizbl. Bot. Gart. Berlin 7: 15–18. 1920.—The genus includes four species of the Philippines, Borneo, Java, and Sumatra, hitherto placed in other related genera. The following new combinations are made: *Tetradema rubrum* (*Trichosporum rubrum* Merr.), *T. tuberculatum* (*Agalmyla tuberculata* Hook. f.), *T. asperifolium* (*Agalmyla asperifolia* Bl.), *T. praelongum* (*Dichrotrichum praelongum* Kränzl.).—*H. A. Gleason.*

2235. Schlechter, R. **Eine zweite Art der Gattung Androcorys Schltr. [A second species of Androcorys Schltr.]** Notizbl. Bot. Gart. Berlin 7: 52, 53. 1920.—*Herminium gracile* King & Pantl. is transferred as *Androcorys gracilis* (King & Pantl.) Schltr.—*H. A. Gleason.*

2236. Schlechter, R. **Orchidaceae novae, in caldariis Horti Dahlemensis cultae. II. [New orchids cultivated in the warm-houses at Dahlem.]** Notizbl. Bot. Gart. Berlin 7: 323–330. 1919.—New species are described as follows: *Cryptophoranthus similis, Stelis calotricha, Octomeria Dusenii, O. irrorata, Bulbophyllum dahlemense, B. paranaense, Promenaea acuminata, P. albescens, Capanemia paranaensis, Oncidium aberrans, Aerangis parvula, Angraecum elephantinum.*—*H. A. Gleason.*

2237. Schmidt. Wilh. **Dendrobium delicatum Bail.** Orchis 14: 1–2. 1920.—*Dendrobium delicatum* Bail. occurs in nature on the rocky cliffs near Toowoomba, Queensland, in company with *D. Kingianum* and *D. speciosum* var. *Hillii.* It is believed that *D. delicatum* is a hybrid between these two.—*E. B. Payson.*

2238. Schneider, Camillo. **Notes on American willows. VII.** Jour. Arnold Arboretum 1: 147–171. 1920.—The present paper deals with the section Adenophyllae containing 8 and with the section Balsamiferae containing 2 species. As in the preceding papers of this series keys to the species are given and each species is discussed in detail. The following species, form and combination are new: *Salix orestera, S. Eastwoodiae* f. *callicoma, S. glaucophylloides* var. *glaucophylla* (Bebb).—*Alfred Rehder.*

2239. Schneider, Camillo. **Notes on American willows. VIII.** Jour. Arnold Arboretum. 1: 211–239. 1920.—This paper deals with the sections Chrysantheae (8 species), Candidae (1 species) and with *Salix Wolfii.* As in the preceding papers of this series keys to the species are given and each species is discussed in detail. The following varieties are new: *Salix Hookeriana* var. *tomentosa* and *S alaxensis* var. *longistylis* (Rydb.)—*Alfred Rehder.*

2240. Smith, J. J. **Orchidaceae novae malayenses IX. [New orchids of the Malayan region.]** Bull. Jard. Bot. Buitenzorg III, 2: 15–127. 1920.—The following new species are described: *Apostasia elliptica, A. platystylis, Corysanthes sumatrana, C. bancana, Didymoplexis Trichechus, Vanilla abundiflora, V. sumatrana, Vrydagzynea deliana, Coelogyne brachygyne, C. imbricans, Dendrochilum Gravenhorstii, D. polluciferum, D. rigidifolium, Liparis mentaweiensis, L. foetulenta, Podochilus bilabiatus, P. bancanus, Appendicula brevimentum, Agrostophyllum sumatranum* Schltr. & J. J. S. var. *borneense, A. confusum, Ceratostylis crassipetala, C. Jacobsonii, C. tricallifera, Phajus callosus* Lndl. var. *sumatranus, P. pauciflorus* Bl. var. *sumatranus, P. pauciflorus* var. *punctatus, P. corymbioides* Schltr., *P. labiatus, Eria taluensis, E. compressa* Bl. var. *sumatrana, E. Jenseniana, E. Nieuwenhuisii, E. oberoniiflora, E. bancana, E. mentaweiensis, E. rubifera, E. scotiifolia, Dendrobium flabelloides, D. denigratum, D. labangense, D. maculosum, D. forcipatum, D. xantholeucum* Rchb. f. var. *obtusilobum, D. stelidiiferum, D. dempoense, D. quinquecallosum, D. Ruttenii, D. Laurensii, D. taurulinum, D. Demmenii, D. croceocentrum, D. Maierae, D. cinereum, D. Groeneveldtii, D. grastidioides, D. fimbrilabium, D. septemcostulatum, D. tetrodon* Rchb. f. var. *Vanvuurenii, Bulbophyllum javanicum* var. *sumatranum, B. rigidifilum, B. farinulentum, B. crepidiferum, B. fibrosum, B. dempoense, B. silapingense, B. lemniscatoides* Rolfe var. *exappendiculatum, B. Theunissenii, B. lumbriciforme, B. Groeneveldtii, B. osyriceroides, B. trichoglottis* Ridl. var. *sumatranum, B. elevatopuncatum, B. lepidum* var. *insigne, B. campanulatum* Rolfe var. *inconspicuum, B. viscidum, Sarcochilus bipennis, S. decipiens, Thrixspermum aurantiacum, T. sumatranum, T. longilobum, T. latisaccatum, T. flaccidum, Saccolabium longicaule, Adenoncos uniflora, Arachnis Vanmullemii, Malleola baliensis, Robiquetia Hansenii, R. viridirosea, Pomatocalpa simalurense, Microsaccus canaliculatus.*—*J. J. Smith.*

2241. Stapf, O. **Thellungia, a new genus of Gramineae.** Bull. Misc. Inf. Kew 1920: 96–99. *Fig. 1–11.* 1920.—This grass probably of Australian origin, was found in the vicinity of Solothurn, Switzerland, near a woollen mill. It is made the type of a new genus, **Thellungia,** related to *Sporobolus. T. advena* is its only known representative.—*E. Mead Wilcox.*

2242. Stapf, O. **Setaria or Chaetochloa.** Bull. Misc. Inf. Kew 1920: 124–127. 1920.—*Chaetochloa* was proposed by Scribner to replace the name *Setaria* for two reasons. *Setaria* was, according to him, first applied by Beauvois to a species of *Pennisetum* and furthermore at an earlier date was employed by Acharius to a genus of lichens. It is shown that Acharius used this name not as a generic one but to designate a tribe. It is further shown that the plant understood by Scribner to be the type of the genus is really a *Setaria* and not a *Pennisetum.* But this species is after all not the type of the genus. The type must be taken as *S. viridis,* which was first used by Beauvois as illustrating the genus *Setaria.* This species is also a true *Setaria.*—*E. Mead Wilcox.*

2243. St. John, Harold. **The genus Elodea in New England.** Rhodora 22: 17–29. 1920.—The writer gives a key to the New England species of the genus *Elodea* of Michaux, synonymous with the genus *Philotria* of Rafinesque and adopted by Rydberg. All of the material is put into four species, *E. canadensis* Michx., *E. occidentalis* (Pursh) St. John, *E. Nuttallii* (Planchon) St. John, and *E. Planchonii* Caspary. The synonymy and bibliography, list of illustrations, and distribution of each of these is given. The article also includes a discussion of the flower structure of *E. canadensis* and the history of its rapid spread in Europe and the British Isles; a description of pollination in *E. occidentalis;* and discussions as to the validity of other species proposed by various authors.—*James P. Poole.*

2244. St. John, Harold. **Trillium rectistamineum, a valid species of the southeastern United States.** Rhodora 22: 78–79. 1920.—*Trillium lanceolatum* Boykin var. *rectistamineum* Gates is raised to specific rank. The name as published is *Trillium rectistamineum* (Gates) comb. nov. A bibliography and description are given.—*James P. Poole.*

2245. St. John, Harold, and Donald White. **The genus Galinsoga in North America.** Rhodora 22: 97–101. 1920.—A synopsis of the North American species of this genus as understood by the authors. The species are distinguished especially by differences in the pappus of the ray- and disc-flowers.—*James P. Poole.*

2246. Traaen, Carl. [Rev. of: Almquist, S. **Sveriges Rosae.** (Swedish roses.) Stockholm, 1919.] Jour. Botany **58**: 115–116. 1920.

2247. Turrill, W. B. **The Rev. H. F. Tozer and plants collected by him in the Nearer East.** Bull. Misc. Inf. Kew **1920**: 29–31. 1920.

2248. Turrill, W. B. **The genus Rosmarinus.** Bull. Misc. Inf. Kew **1920**: 105–108. *4 fig.* 1920.—In a brief revision of this genus 4 species are recognized and of *R. officinalis* L. several varieties and forms. The variety *R. officinalis* L. var. *genuina* is described as new.—*E. Mead Wilcox.*

2249. T [urrill], W. B. **Carex riparia var. gracilis in Britain.** Bull. Misc. Inf. Kew **1920**: 141–142. 1920.

2250. Ulbrich, E. **Neue Arten der Gattung Hibiscus Sect. Bombycella DC.** [**New species of Hibiscus Sect. Bombycella.**] Notizbl. Bot. Gart. Berlin **7**: 19–25. 1920.—Nine species, chiefly from Africa, are described as new, as follows: *Hibiscus serratifolius, H sulfuranthus, H. sumbawanus* Warburg & Ulbrich, *H. ahlensis, H. meidiensis, H. heterochlamys, H. flavifolius, H. gallaënsis,* and *H. chrysochaetus.*—*H. A. Gleason.*

2251. Ulbrich, E. **Einige neue Lupinus-Arten aus den Anden von Peru.** [**Some new species of Lupinus from the Andes of Peru.**] Notizbl. Bot. Gart. Berlin **7**: 452–454. 1920.—Three new species are described as follows: *Lupinus matucanicus, L. pinguis,* and *L. misticola.*—*H. A. Gleason.*

2252. Vaupel, F. **Neue afrikanische Iridaceen.** [**New African Iridaceae.**] Notizbl. Bot. Gart. Berlin **7**: 31–35. 1920.—New species are described as follows: *Acidanthera divina, Antholyza pubescens, Gladiolus Boehmii, G. Bussei, G. Mildbraedii, G. validissimus.*—*H. A. Gleason.*

2253. Wernham, H. F. **Dewevrella congenesis sp. nov.** Jour. Botany **58**: 80–81. 1920.—This genus of the Apocynaceae was founded as recently as 1907 by De Wildeman, and the only known species is *D. cochliostema.* The present new species, the second in the genus, was collected by M. A. Nannan in the same district, namely, Boyeka at the equator.—*K. M. Wiegand.*

2254. Wernham, H. F. **Tropical American Rubiaceae.—XIII.** Jour. Botany **58**: 105–108. 1920.—The genus *Coupoui* is considered in this number. A historical account is given of the genus beginning with the original description by Aublet in 1775. It has been very poorly understood owing to a lack of flowering material. The genus is here held to belong to the Rubiaceae though by earlier authors it was placed in the Apocynaceae and Myrtaceae. A key is given to the three known species, also synonymy and notes on distribution. *C. brasiliensis* is described as new.—*K. M. Wiegand.*

2255. Wiegand, K. M. **Eupatorium purpureum and its allies.** Rhodora **22**: 57–70. 1920.—By the examination of the material ordinarily recognized as *Eupatorium purpureum,* the writer has worked out a treatment for this section of the genus. Four species and one variety have been confused under the general name *E. purpureum* L., now separated as *E. verticillatum* Lamarck, *E. maculatum* L., *E. maculatum* var. *foliosum* (Fernald) comb. nov., *E. purpureum* L., and *E. falcatum* Michx. The facts and the history as to the synonymy and nomenclature of these species are given in considerable detail as well as a key for their identification.—*James P. Poole.*

2256. Wilmott, A. J. **Erythraea scilloides Chaubard.** Jour. Botany **58**: 23. 1920.—The author discusses the proper name for a plant found in Pembrokeshire, taking exception to the disposition of the plant made by Druce.—*K. M. Wiegand.*

2257. Wolley-Dod, A. H. **On collecting roses.** Jour. Botany 58: 23–24. 1920.—It is suggested that more attention be given to collecting roses in the reddened-fruit stage, as in that condition British roses, at least, are most satisfactorily identified.—*K. M. Wiegand.*

2258. Wolley-Dod, A. H. **A revised arrangement of British roses.** Jour. Botany 58: Suppl. 1–20. 1920.—The author discusses the present status of the rose question, stating that by the proper treatment of varieties a working classification can be arranged. The work of Déséglise is found to be very unsatisfactory, many of the forms having been based on single specimens. A tabular synopsis of the British roses is given consisting of five sections and many subsections, groups, secondary groups, and subgroups. The species under each are considered at length with synonymy and notes. Many varieties and some forms are recognized under most of the species.—*K. M. Wiegand.*

2259. Zimmerman, Walther. **Meitteilungen zur Orchiaceras-Gruppe aus Baden.** [**Contributions on the Orchiaceras group from Baden.**] Mitteil. Badischen Landesver. Naturk. u. Naturschutz Freiburg im Breizgau N. S. 1: 21–31. 1919.—A study of hybrids occurring in nature between species of *Orchis* and *Aceras*. The following new hybrids are named and described with the probable parents indicated in parentheses: *Orchiaceras spuria* Cam. forma *Neumannii* (*Orchiaceras spuria* × *Aceras anthropophorum*), *O. macra* Cam. forma *rhenana* (*Orchis purpureus* × *Aceras anthropophorum*) and *O. macra* Cam. forma *freiburgensis* (*Orchis purpureus* × *Aceras anthropophorum* or *Orchiaceras macra* × *Orchis purpureus?*). The various hybrids and their parents are illustrated.—*E. B. Payson.*

MISCELLANEOUS, UNCLASSIFIED PUBLICATIONS

B. E. Livingston, *Editor*
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2260. Anonymous. **Something about artificial silk.** Sci. Amer. Monthly 1: 516–517. 1920. [From American Silk Journal, April, 1920.]—Artificial silk is spun from a thick, viscous liquid, called viscose, which is prepared from wood. Article considers the present production and possible sources of future supply of this commercial product.—*Chas. H. Otis.*

2261. Anonymous. **Voices of trees.** Brooklyn Bot. Gard. Rec. 9: 103–105. July, 1920.—Observations of Mr. John Grimshaw Wilkinson, the blind botanist of Leeds, as given by Prof. W. H. Bragg in lecture on "Sounds" at the Royal Institution. Reported in London Times, Jan. 8, 1920. During rain, the most silent tree is *Pinus sylvestris*, the noisiest are oaks.—*C. S. Gager.*

2262. Dasen, A. H. **Ellaboración a domicilio de vinagre de plátano.** [**Home vinegar making from plantains.**] Rev. Agric. Com. y Trab. [Cuba] 3: 253–254. 1920.—Translated and slightly modified by A. Brambila, from Bull. Agric. Soc. Trinidad and Tobago 20. Feb., 1920.—*F. M. Blodgett.*

2263. Durrell, L. W. **Tongs for handling disinfected seed.** Phytopath. 9: 581–582. *1 fig.* 1919.—A description of tongs for removing seed from test tubes.—*J. G. Dickson.*

2264. Lapicque et Brocq-Rousseu. **Les algues marines comme aliment de travail pour le cheval.** [**The marine algae as food for horses.**] Compt. Rend. Acad. Sci. Paris 170: 1601–1603. 1920.

2265. Pantanelli, E. **Uso del cipollaccio per l'alimentazione e la produzione di alcool.** [**The use of Muscari comosum Mill. for food and for alcohol production.**] Staz. Sper. Agrarie Ital. 53: 101–112. 1920.—The bulbs of *Muscari comosum* Mill. as well as of *Hyacinthus ciliatus* Cir. were found to be very nutritious and well adapted to alcoholic fermentation after a previous treatment with dilute acid, to hydrolyse the polysaccharides, and subsequent neutralization with calcium carbonate. The alcohol production of *Muscari* was found to be 10.5 per cent, while *Hyacinthus* yielded 8.4 per cent of the fresh bulb substance.—*A. Bonazzi.*

2266. Pavarino, G. L., e G. Castellari. **Il Falasco nell'industria della carta. [The marsh vegetation and paper industry.]** Staz. Sperim. Agrarie Ital. 53: 32–46. *Pl. 1.* 1920.—The vegetation of the marshy places in the province of Pisa (Italy) is known by the local name of *falasco*, and is made up of *Phragmites communis*, various species of *Carex*, various species of *Scirpus*, *Cyperus*, and *Typha*, together with *Schoenus mariscus*, *Calamogrostis epideios*, *Arundo donax*, several species of *Juncus*, *Sparganium ramosum*, *Gliceria aquatica*, and *Sagittaria angustifolia*. Some of the plants thus found are utilized in the manufacture of rope, mats, etc., but a great portion of them is allowed to decay. The present contribution considers the botanical, physical, microscopical, and chemical characters of the various plants and takes up also the question of bleaching with SO_2 and $KMnO_4$. The results of the investigation may be summarized as follows: *Carex paludosa* yielded 43 per cent of cellulose, *Phragmites communis* 47.5, *Scirpus lacustris* 45.5, *Typha angustifolia* 44.0, and *Cyperus longus* 25.0 per cent. In most cases the fibers are long and regular and well adapted to paper manufacture.—*A. Bonazzi.*

2267. Stockham, W. L. **Some factors related to the quality of wheat and strength of flour.** North Dakota Agric. Exp. Sta. Bull. 139. *69 p., 3 fig., 13 charts.* 1920.—The smallest loaf volume is secured from soft white wheat, an increase in volume being noted for soft red winter, durum, hard red winter, and hard red spring, in order.—No correlation exists between bran color and baking quality of flour.—Low bacterial infection of berry was found to be associated with "brightness" of the sample.—In study of 28 pure line Ghirka wheats loaf volume increased with increase of protein content of flour up to 13.5 per cent and then decreased as protein content increased. Adding gluten to flour increased loaf volume materially. Lack of strength in low grade flours is not due usually to lack of gas but rather to inability of baking loaf to retain it. Amount of gas generated by loaf was usually correlated with amount of extractives present in flour. Adding aqueous extract from different flours increased loaf volume and decreased time required for loaf to rise. Crude fat secured from flour added to flour increased loaf volume. Other fats added decreased loaf volume.—No correlation was found between ratio of soluble to total protein in flour and volume of loaf produced therefrom.—Proteolytic activity of various grades of flour differed greatly. The greatest was found in straight flour from sprouted wheat and less from high grade flours. Flour from germ end showed much less expansion and more proteolytic activity than flour from blossom end. Milling results are given from germ and blossom end of kernels. Gluten added to wheat germs increased proteolytic activity. Proteolytic activity of ground wheat was greater than the corresponding flours made from such wheats and was greater in wheats injured by weathering and exposure.—In general, water absorption increased with an increase of protein content in flour. With increase in ash content in flour the ratio of water absorption in flour to protein content decreased. The relation of mineral constituents to gluten quality is discussed.—The effect of certain salts and acids in baking tests, mainly as affecting the colloidal action of gluten, is shown. Effect of acids and NaOH upon strength of flour and texture of loaf was injurious.—From a quantity of wheat kept in storage for 9 years, samples for milling were taken at intervals. An improvement in flour strength and loaf characters was noted for about one year but no appreciable deterioration was noted until after lapse of 7 years, but flour milled from the old wheat deteriorated markedly in strength after 4 months storage with decided falling off in loaf texture.—Studies were made upon the effect of oxidation upon enzyme activity with no decisive results.—An extended review of literature is given.—*L. R. Waldron.*

2268. Strand, E. [Rev. of: Thesing, C. **Biologische Streifzüge. Eine gemeinverständliche Einführung in die allgemeine Biologie. (Biological excursions. A popular introduction to general biology.)** 2nd edition. *364 p., 6 colored pl., 74 fig.* Esslingen and München, 1908.] Arch. Naturgesch. Abt. A. 83: 172, 173. (1917) 1919.

2269. Tunison, Burnell R. **Industrial alcohol.** Jour. Franklin Inst. 190: 373–420. 1920.—A general summary of the subject, including history, legislation, manufacture, pro-

duction, distribution and uses. "Any laboratory may obtain pure ethyl alcohol tax free for use exclusively in scientific research," according to present legislation in the United States.—*Ernest Shaw Reynolds.*

2270. Wolf-Czapek, K. W. **Angewandte Photographie in Wissenschaft und Technik. [Applied photography in science and technology.]** 4 vols., illustrated. Union Deutsche Verlagsgesellschaft: Berlin, 1920.

2271. Zillig, H. **Kriegsersatz ausländischer technisch verwerteter Pflanzenfasern. [War substitutes for foreign utilizable plant fiber.]** Jahresber. Ver. Angew. Bot. 16: 79–116. 1918.

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